The Accidental Deregulation

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The Accidental Deregulation

Essays on Reforms in the Swedish Bus and Railway Industries 1979-2009

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Preface

This report is a result of a research project carried out at the Centre for Marketing, Distribution and Industry Dynamics at the Economic Research Institute at the Stockholm School of Economics.

This volume is submitted as a doctor's thesis at the Stockholm School of Economics. As usual at the Economic Research Institute, the author has been entirely free to conduct and present his research in his own ways as an expression of his own ideas.

The institute is grateful for the financial support which has made it possible to fulfill the project.

Filip Wijkström

Director of the Economic Research Institute
at the Stockholm School of Economics

Björn Axelsson

Director of the Centre for Marketing,
Distribution and Industry Dynamics
at the Stockholm School of Economics

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This thesis would not have been written without the help and support from a great number of people and organisations.

My supervisor and colleague, Associate Professor Staffan Hultén at Stockholm School of Economics, is by far the most important person in this respect. In 1994, he brought my attention to the rapid changes in the Swedish bus sector, assigning me to write a paper on the subject as a final part of my under-graduate studies. He later convinced me to formally become involved as a doctoral student in his research project on public transportation. From then on, we have worked closely together on a number of related projects. From the very beginning, Staffan has continuously supported me in my research, being an endless source of ideas and suggestions. Moreover, his support has also reached beyond the work-related matters in my life, encouraging me to keep going in both good and bad times. To say that I am grateful for all this is really an understatement.

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My research has been supported by funds from several different institutions and organisations. In my initial research on the bus industry I started off with funds from KFB (Kommunikationsforskningsberedningen – National Board of Communications Research), an organisation that later contributed significantly to funding my research on the railway industry. Banverket (The National Rail Administration) became an equally important

contributor in this respect. Special thanks to Nils Edström, involved in both of these organisations, and Malcolm Lundgren, Åke Lewerentz, Bo Olsson, Lars Hellsvik and Hans Råberg at Banverket. Funds have also come from the Dutch Ministry of Transport (Swedish railway reforms), SJ (development of X2000), SIKA (long-distance coaches), VTI (following-up on the Swedish bus deregulation), RTK (commuter trains of Stockholm) and Vinnova (Public-Private Partnerships in the transportation sector). In one way or another, all these projects have contributed to my development and writing, eventually leading to the text at hand. During periods of my thesis writing I have also been partly funded by the Stockholm School of Economics.

In 2008 I took a break from my doctoral studies and spent almost a year working as economics adviser for the Community of European Railways and Infrastructure Companies (CER) in Brussels. Making all the hard work worthwhile, I got to know and meet many inspiring people from all parts of the European railway sector. Also, my colleagues at CER made me learn and achieve things I would not have done otherwise. I am particularly grateful to Kostas Rigas, Matthew Ledbury, Raffaella de Marte, Delphine Brinckman-Salzedo, Britta Schreiner, Jacques Dirand and last but not least the directors Johannes Ludewig and Libor Lochman for giving me the opportunity to work for CER.

Naturally, I also want to thank everyone working in the Swedish bus and railway industries and other organisations that I have met and interviewed over the years. Thank you for being so open, patient and informative. Some of you are listed among the interviewees, but there are many more who have also contributed with data, knowledge, experience and, most importantly, their time. Special thanks to Olof Nordell, Johan Masgård, Tord Hult, Thomas Adelöf, Helena Sundberg, Bo Fredriksson, Ulf Thunberg, Jan Johansson, Anders Lundberg, Peter Puusepp, Tommy Nilson, Lars Nordstrand, Mikael Prenler, Rolf Torwald, Kjell Åbrink, Ragnar Norbäck, Einar Smitterberg, Staffan Håkansson, Mats Waering, Peder Wadman, Ragnar Hellstadius and Stig Larsson.

Finally, this thesis would not have been possible to complete without the loving support from my family, most notably my wife Eva (remarkably the only one never to nag me about when my thesis would be finished!), my sister Karin and her husband Kevin Frato (who made a huge last-minute effort to check grammar and language), and last but not least my parents and parents-in-law.

Sundborn in August, 2010

Gunnar Alexandersson

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Part 1. Introductory chapters

1. Introduction

In economics, politics, and society as a whole, issues like state intervention upon markets through regulation or ownership have been discussed for a very long time. In a broad sense, the following questions have been raised: Should the state intervene at all? If so – how much, when and in what industries, and by what means? And when intervention involves regulations, how should they be designed in order to both stimulate and control the development and functioning of markets in a desirable way? Not only do the answers to these questions vary depending upon whom you ask, they also vary over time. Industries and markets change over time and so do attitudes towards regulation, which results in processes of regulatory change.

During the past 30 years, many countries have implemented reforms aimed at deregulation and privatisation in industries where regulation and public ownership used to prevail. Such reforms have, for example, affected banking and financial industries, electric utilities, telecommunication industries and the transportation sector. These reforms and their consequences have been the subjects of much research, reported on in numerous articles, books and reports, contributing to on-going political debates. Experiences reported from specific countries and specific industries have come to affect the process of regulatory change in other countries and industries.

This thesis deals with regulatory changes in the Swedish bus and railway sectors from 1979 to 2009, focussing on the development since the late 1980s, primarily related to passenger services. Table 1 provides an overview of the regulatory framework for the Swedish bus and railway markets, highlighting the differences between the years 1988 and 2008. From a situation in the late 1980s, when competition in any form was virtually non-existent (at least within modes of transport), Sweden has gradually moved to a system based upon competitive tendering and (to some extent) open entry. The only part of the market where a legal monopoly still prevails, concerns the inter-regional train services that the state-owned national railway operator, SJ, is able to run without any direct subsidies. In addition to this, there are some local bus markets served by municipally-owned bus operators, and some regional train services run by SJ under long-term contracts with local and regional authorities, that have not been subjected to tendering yet. During 2009, a process was initiated to abolish this last part of SJ's monopoly, in effect opening up the whole network to competition step-by-step 2009-2012. Also, there is an ongoing discussion about reforming the current system of competitive tendering of local and regional buses, which might lead to open access in this part of the market.

Table 1. Regulatory structure of the Swedish bus & railway sectors in 1988 and 2008

Part of transport market	1988	2008
Passenger services by bus		
Local and regional	Bus companies have exclusive route licenses and receive subsidies from regional authorities	Procurement by competitive tendering (since 1989)
Inter-regional	Limited services New entry blocked by SJ	Open access (limited only by regional authorities) (since 1999)
Passenger services by train		
Regional (non-profitable)	SJ holds monopoly and receives subsidies	Procurement by competitive tendering (competition *for* the tracks) (since 1990)
Inter-regional (non-profitable)	SJ holds monopoly and receives subsidies	Procurement by competitive tendering (competition *for* the tracks) (since 1993)
Inter-regional (profitable)	SJ holds monopoly	SJ holds monopoly (about to be abolished 2009-2010)
Freight services by train	SJ holds monopoly	Open access on all lines (competition *on* the tracks), to some extent limited by grandfathering 1996-2004

The changes since 1988 constitute a palpable shift in the regulatory framework, with important consequences for the structure and functioning of these parts of the transportation markets. In comparison to many other countries, in particular in Europe, the Swedish reforms in this sector have also been both far-reaching and implemented at a very early point in time.

How and why did this shift in industry organisation and regulatory framework come about? Why did one practice – competitive tendering – become so dominant? What have these changes meant for the industry? Are there any lessons to be learned that might be transferable to regulatory changes in other countries or other industries? Trying to answer questions like these has characterized the work behind this thesis.

Consequently, I have spent much time tracing the sequence of events and regulatory changes during their various stages of development. Moreover, although the content of this thesis concentrates on changes during recent decades, it has also been necessary to consider the historical background in order to get a better understanding of later events.

Aims and issues

This thesis has several aims and deals with a number of issues. One aim is to improve our understanding of why regulatory reforms in the Swedish bus and railway sectors have come about and why these reforms have acquired a certain form. I also seek to compile a thorough overview of industry development during the last few decades, including earlier historical origins of later reforms. Another aim is to explore and explain the outcome of these reforms. Finally, I intend to provide some normative advice concerning the design and implementation of regulatory reforms.

In short, most of the issues of interest in this thesis may be treated as elements of the following basic research questions:

1. What are the initiating and driving factors behind the reforms?
2. What are the effects of the reforms?

In answering these two basic research questions, I also aim to generate theoretical as well as normative lessons regarding regulatory reforms in these and other sectors. This could therefore be viewed as an over-riding or additional research objective.

Reforms may range from small incremental steps to more radical and groundbreaking changes. In this respect, the time factor is also of importance for how we look at certain reforms. Sometimes substantial reforms are intentionally designed to be fully implemented after an extended period of time in order to facilitate implementation and adaptation to the new framework. In retrospect, it may seem simple to answer the question why a certain reform came about, but one of the main ideas in this thesis is the importance of taking a closer look at the actual events and processes leading to individual reforms. As will be shown, the result may be a rather complex picture and sometimes the actual explanations differ substantially from commonly held beliefs, which may actually have been influenced by later events and post-rationalisation.

It is difficult to separate a discussion on effects of regulatory reforms from the intentions behind these reforms. In some cases, it *is* possible to make this kind of comparison, but given the complex process of how reforms come about and the possibility of unexpected outcomes, sometimes it may not even be useful to evaluate reforms in this manner. Instead, it may be more rewarding to take a certain reform as given and then consider its effects and how they may vary depending on differences in terms of implementation, for example between regions. This approach has played an important role in the research behind this thesis, tracing the effects of regulatory reforms in terms of the changed behaviour upon market actors and the presumingly related changes in factors such as costs of production, subsidy levels, market shares

etc. Another important topic has been to look at how certain reforms have led to a demand for additional reforms, setting off a chain of development that was difficult to foresee although it may seem natural and logical in retrospect. The unexpected results of reforms form a special topic of interest in this thesis. On a related note, the thesis will also delve into the problems and difficulties linked to the implementation of reforms and corporate behaviour in liberalised and sometimes unstable markets. In the sectors at hand, such problems have often been highly publicized due to their impact on employees and ordinary end-consumers of public services, but they are also important to consider in more general terms such as the overall functioning of the market. Here, I have taken a particularly close look at the problems related to corporate behaviour in tendering situations. Most of the normative lessons to be learnt from this thesis have evolved from these analyses.

Overview of the rest of the thesis

Following this introduction and background, chapter 2 will consider the methodological issues related to the research. The third chapter will then be devoted to theoretical issues and concepts. The international experiences from deregulation in the transport sector are considered in chapter 4, forming an introductory context to the Swedish reforms. Chapter 5 covers the contextual development of regulatory reforms in other Swedish industry sectors. The sixth chapter concludes the first part of the thesis, providing the historical background to the development of the Swedish bus and railway sectors as well as a detailed presentation of reforms and events which reconfigured these sectors from 1989 to 2009. Part 2, the bulk of the rest of the thesis, is then devoted to seven essays, dealing with various issues as described below.

The first essay, "The Effects of Competition in Swedish Local Bus Services", is an article on the early experiences (1987-1993) of local and regional bus deregulation in Sweden. This text was initially published in the Swedish journal *Ekonomisk Debatt* in 1996, followed by an English version presented at the EARIE conference in Vienna the same year. In 1998 it was published in *Journal of Transport Economics and Policy*.

The second essay, "Bus Deregulation in Sweden Revisited: Experiences from 15 Years of Competitive Tendering", is a follow-up article to the first essay, looking at the long-term effects of bus deregulation (up to and including the year 2001). An early version of this article was presented at the 8th Conference on Competition and Ownership in Land Passenger Transport in Rio de Janeiro 2003. It has recently been reworked substantially and is due for submission to *Journal of Transport Economics and Policy*.

The third essay, "The Swedish Railway Deregulation Path", deals with the regulatory reforms in the Swedish railway sector, tracing their origin and development from 1979 and onwards. It also discusses the theoretical background to reforms and deregulations in the railway sector in general. The essay was published in *Review of Network Economics* in 2008.

The fourth essay, "Rail Privatization and Competitive Tendering in Europe", focuses on one important element of regulatory reforms in Europe: competitive tendering. It reviews the theoretical motives and origins behind the introduction of competitive tendering or similar procedures, presents an overview on railway reforms and tendering in all the 27 EU countries, and then discusses a couple of countries in more detail. This essay was published in *Built Environment* in 2009.

The fifth essay, "Predatory Bidding in Competitive Tenders – a Swedish Case Study", deals with one specific problem related to the introduction of competitive tendering and the establishment of international railway companies in Europe – the appearance of predatory bids. A Swedish version of this text was published in *Ekonomisk Debatt* in 2003. English versions were presented at three international conferences during 2003, followed by a revised version published in *European Journal of Law and Economics* in 2006.

The sixth essay, "High and Low Bids in Tenders: Strategic Pricing and Other Bidding Behaviour in Public Tenders of Passenger Railway Services", digs deeper into the behaviour of bidders in tenders and the possible reasons for unexpected or extreme outcomes. This text was presented at three international conferences 2004-2005, and in its current form the article was published in *Annals of Public and Cooperative Economics* in 2007.

The seventh essay, "Prospects and Pitfalls of Public-Private Partnerships in Railway Transportation. Theoretical Issues and Empirical Experience", takes a closer look at the various ways to involve the private sector in the post-reform European rail sector. In particular it discusses the concept Public-Private Partnerships in infrastructure projects. The paper builds upon research presented at several conferences and was ultimately published in *International Journal of Transport Economics* in 2009.

Following the essays, Part 3 contains the final and concluding chapter, in which the process of regulatory changes in the Swedish bus and railway sector is analysed and compared, drawing both from the introductory chapters and the essays. In this chapter I also extract a number of theoretical and normative lessons – including some more general remarks on regulatory reforms – and raise some additional ideas and issues suitable for further research.

2. Methodology

In this chapter I will present and discuss the methodology used in my research, including a rather thorough description of my research process.

As a starting point, it is important to note that the research behind the papers and articles presented in this thesis has been carried out during a long period of time, and the methodological approach has therefore differed somewhat from time to time. This is also due to the somewhat varied character of the specific studies. However, the main methodological principles and guidelines, as described in this chapter, have remained the same.

Scientific approach

Every researcher at some point has to consider the ontological and epistemological foundations for their research, since these underpinnings will unavoidably have implications for the chosen methodology.[1] Expressed in a very simplified manner, my scientific approach has mostly been that of a *realist*. According to the realist, reality and knowledge and facts about reality exist by themselves, independent of the observing scientist or at least prior to their investigation. As such, these facts are possible to extract by means of research. In theory, this should be possible to do in an objective manner, regardless of who carries out the research. However, I do acknowledge that different researchers may arrive at different results, depending upon their knowledge, skills, methods and tools for research and interpretation. Also, as will be further argued in the final section of this chapter, the researcher's findings and interpretations may – depending on how they are communicated – influence the further development of reality and/or the way people look upon reality.

Given that I have been involved in the research of a rather wide array of phenomena over an extended period of time, I will be the first to admit that I have both allowed myself to take somewhat different scientific approaches on different occasions, and also experienced a development in the way I view reality, scientific knowledge and the conditions for research. To some extent this has affected the way I have been practising research, but perhaps more how I have expressed and analysed my findings. Starting from a mostly

[1] Ontology, or the theory of being, deals with the philosophical questions regarding existence and concepts of reality. Epistemology, or the theory of knowledge, covers subjects such as the nature and production of knowledge and the limits to what people actually know.

positivistic perspective and deductive approach, which has affected a couple of essays in this thesis, I have also come to appreciate the insights to be made from more interpretative and inductive approaches. In my view, positivistic knowledge and interpretive knowledge do complement each other, providing explanations *and* understanding, respectively (see e.g. Lee, 1994).

In retrospect, drawing from the work of Lawson (1997), Bhaskar (1978) and others, I might define my position as being a follower of what can be referred to as "transcendental realism". As will be explained here, this is rather different from the original realist approach, which could also be called empirical realism. Empirical realism, forming the basis for positivism and deductive approaches, advocates a view on reality as "consisting of the objects of experience or impression constituting atomistic events" (Lawson, 1997, page 19). From this it follows that the role of science is to build knowledge by means of revealing regularities, patterns and links between these atomistic events, sometimes even expressed as "laws", albeit with some probabilistic features. One problem with this view is that it narrows the scope for science, especially in the social domain, and the usefulness of scientific results. This calls for the broader, alternative ontology of transcendental realism that will be better fit for scientific research of natural as well as social phenomena.

Lawson (1997) states that there are two main differences between empirical realism and transcendental realism. Firstly, according to transcendental realism, "the world is composed not only of events and states of affairs and our experiences and impressions, but also of underlying structures, powers, mechanisms and tendencies that exist, whether or not detected, and govern and facilitate actual events" (p. 21).

As Lawson proposes, many complex things (including systems) in the world can, by their constitution or *structure*, possess certain *powers* (capabilities, potentials, capacities etc) that may or may not be used. For example, a forklift has the power to facilitate the lifting of heavy objects, even when it is currently not in use. In other words, powers may exist even when they are not being exercised. This means that investigating the structures of complex things can reveal their potentials. A *mechanism* is a way of acting upon or working a structured thing, based upon its inherent powers, typically by means of some form of input, for example by turning the key to start an engine. Mechanisms, when triggered in a relevant setting, will then have effects. Consequently, structured things "possess causal powers which, when triggered or released act as generative mechanisms to determine the actual phenomena of the world" (Lawson, 1997, p. 21).

The world in this view is clearly made up of more than the actual course of events and our experiences, leading to the second difference between transcendental realism and empirical realism. As Lawson points out,

transcendental realism distinguishes between three domains of reality: the empirical (experience and impressions), the actual (actual events and states of affairs) and the real (structures, powers, mechanisms and tendencies). Crucially, these domains and their characteristic components are out of phase with each other. For example, experience is out of phase with events, making it possible to account for different people experiencing the same event in different ways. The independence of mechanisms from the events upon which they bear also means that events can be determined by a number of different and sometimes counteracting influences, which can make it difficult to directly see the impact of individual mechanisms. Mechanisms that are in force but perhaps not clearly visible due to the action of other forces in an open system are conceptualised by transcendental realism as *tendencies* (Lawson, 1997, p. 22ff).

By taking the transcendental realist view, science does not have to confine itself to, or even be dependent upon, the search for constant links between events. Rather, it can aim at finding and revealing the structures, mechanisms, powers and tendencies that govern or facilitate the course of events, and make an account of which factors have contributed to certain observed phenomena of interest.

The beauty of transcendental realism is that it can be applied to both natural sciences and social sciences, without really facing any difficulties. In fact, it can be argued to offer a better understanding of the nature of knowledge produced by natural scientists while at the same time taking care of the problems economists sometimes face when they have to abandon the methodology preferred by theory in order to be able to say anything about the real world. For example, transcendental realism makes it easier to consider the fact that people make choices and, more precisely, do not always make the same choices all the time. This makes it possible to abandon the conception of human beings as merely passive respondents to "signals".

To conclude this section, I want to add that I have a strong belief in empirical research as an instrument for building knowledge and I also hold the position that new theories and hypotheses should be primarily based upon – or at least be verified through – empirical studies. This is similar to the approach suggested by the original version of the so-called *grounded theory* model (Glaser & Strauss, 1967) and its focus on inductive and hypothesis-generating research.[2] However, as mentioned above, I have also practised hypothesis-testing and thereby more deductive approaches to draw conclusions from my empirical data.

[2] Grounded theory has later developed into several different strains of theories, some of them deviating substantially from the original approach.

Theory should provide a framework for the studies to be undertaken, as well as some tools to structure and interpret the empirical data. Some parts of my research have involved efforts to reveal a series of events over an extended period of time, as well as finding the data necessary to present the current state of the markets in terms of e.g. buyers and suppliers and other conditions for competition. The results have sometimes been texts that may seem "descriptive" in terms of how they are presented. However, my theoretical foundations, tools and perspectives have nevertheless helped me to identify and choose the things that are to be presented (see for example Fleck, 1935/1979, for a development of this argument).

Combining quantitative and qualitative methods and using various sources of data

In my research I have typically tried to combine quantitative and qualitative methods, since I firmly believe that they complement each other. When used together, they may provide a better understanding of the subject or phenomenon to be studied.

On the one hand, quantitative methods such as multiple regression analysis of time series data have helped me answer questions like:

- May different practices regarding the extent of tendering explain differences in economic performance?
- What role does company size play in the ability to win tenders?
- Does the type of company ownership affect the economic performance?
- Do companies behave differently in tenders of different size and with different types of contracts?
- Are some firms more prone to place extreme bids in a tendering situation than others?

On the other hand, qualitative methods such as content analysis of oral as well as written sources have helped me complement the statistics needed for quantitative calculations. Qualitative analyses have also provided important background information, both in terms of hard facts (like market shares for various firms) as well as "soft" information, enabling me to understand and describe company behaviour, industry preconditions and industry development over time.

Data sources and processing of data

As follows from the above, I have used a large variety of empirical material in my research. Empirical sources have been:

- Statistics from central and local organisations, for example concerning the supply of public bus services and the related costs in each county.
- Personal interviews and telephone interviews with many people involved in the industries studied. In total, I have interviewed about 170 people and several of them on more than one occasion, making the total number of interviews well above 200. Most of these interviews have been recorded in order to avoid transcribing errors.[3]
- Printed material, e.g. annual reports from authorities (such as the CPTAs), bus operators and railway operators, state official reports and studies, government propositions, laws and regulations, documentation from competitive tenders, industry magazines, newspapers and press releases, etc.

Written sources such as annual reports have been examined thoroughly and repeatedly in a search for information regarding both general developments and more specific events (such as tenders). The selected information (sometimes single figures, sometimes one or several sentences) have then been entered into Excel spreadsheets, organised under appropriate headings. (I have not used any specialized software intended for content analysis.) The information gathered during interviews has often been treated in the same way. In particular, the empirical work behind the four included articles on tendering of bus and railway services, depended heavily on this systematic approach. To mention one example, it resulted in databases containing both quantitative and qualitative data regarding all tenders performed by all different transport authorities, making it possible to spot trends and identify similarities and differences between different geographic regions. Organising data in this way, and combining and comparing information from several different sources, has also facilitated the cross-checking of different sources regarding similar objects of research. I have been able to verify or dismiss certain information, as well as increase my overall knowledge about my objects of research. This has been possible not least by expanding the available set of tools for analysis. For example, since the combination of information from several sources enabled the compilation of a complete or near-complete set of data regarding quantifiable variables related to tenders, it became possible to test certain hypotheses with econometric analysis.

[3] All interviews performed are listed in Appendix 1.

Whenever I have found inconsistencies between the empirical findings gathered through interviews as compared to other sources, I have tried to get back to the interviewed person in order to get a clarification. I have also spent much time comparing the official figures from industry statistics with the raw data of the original sources, which has helped me sort out various errors and misunderstandings. In effect, I have been able to generate a refined version of industry statistics, which was absolutely necessary for the two articles on bus tendering. I also consider this to be an important contribution in itself of my research. One drawback of all this work, however, has been the somewhat limited possibilities to compare my findings with those of other researchers who have chosen to use the official figures.

The research process

In order to understand why this thesis looks the way it does I find it useful to explain my research process and its contribution to the content. Broadly speaking, the material presented in this thesis, and the other texts I have written and co-written over the years, are the results of looking repeatedly at the same principal events and industry developments, but in several different ways, asking new or revised questions and using alternative perspectives. In this process, the empirical material and findings have constantly expanded, making new types of analyses possible.

The initiator to my research was a proposal in 1994 from the Swedish Public Transport Association (SLTF) to write an undergraduate thesis about the rapid developments in the Swedish local bus sector following the introduction of competitive tendering. In the resulting study (Alexandersson & Alexandersson, 1995, a joint effort with Ms. Eva Haraldsson, who came to be my wife before it was completed), the focus was to look at the effects of tendering in various counties, also taking into account the different ways of implementing the new regulatory framework. The main theoretical framework in this study was the Structure-Conduct-Performance (SCP) model as presented by Scherer & Ross (1990) among others. Based upon this work, an article in Swedish was written and published in the Swedish journal *Ekonomisk Debatt* (Alexandersson, Fölster & Hultén, 1996). An English version was presented at the EARIE conference in Vienna the same year, and a revised version was later published in the *Journal of Transport Economics and Policy* (Alexandersson, Fölster & Hultén, 1998). This article is now reprinted in the thesis at hand.

Having stayed mostly faithful to the bus industry from the beginning (except for a report on the development and future of the Swedish high-speed train X2000), the year 1997 meant a definite shift of my main focus of interest to another part of the transportation sector: the railway industry. In

1996, the Swedish Railway Authority (Banverket) gained the status of sector responsibility for the railway industry. At the same time, freight transportation by rail became largely deregulated in Sweden. In its new role, Banverket found it important to follow the impact of the regulatory changes and together with the National Board of Communications Research (KFB) a new research project was initiated. In order to perform a pilot study I went to Great Britain to get first-hand information regarding the on-going process to privatise the whole British railway sector, meeting government officials and researchers. The result was a report on railway deregulation in theory and practice (Alexandersson, Hultén and Ehrling, 1997), which had some impact on the on-going political process to pursue additional reforms in the Swedish sector (as explained further below). While this report became the starting point for a three-year study of regulatory reforms in the Swedish railway sector, my attendance at the 5th Conference on Competition and Ownership in Land passenger Transport in Leeds 1997 initiated a parallel line of related research. Contacts were made with the Dutch researcher Didier Van de Velde, leading to a participation in a multi-country comparative study of railway reforms in Europe and Japan. This research was financed by the Dutch Ministry of Transport and resulted in national overviews as well as several detailed case studies (e.g. looking at specific regions in Sweden and the impact of some pioneering companies). In 1999 the book *Changing Trains*, building on this research, was published by Ashgate (edited by Van de Velde), forming the basis for an international conference and workshop at the Stockholm School of Economics the same year. Some material from this research also found its way into the final report book *Spåren efter avregleringen* from the Banverket/KFB project on railway deregulation (Alexandersson, Hultén, Nordenlöw & Ehrling, 2000). During these years, I was also involved in writing a number of other papers and reports, such as an article on the construction of the Arlanda Airport Link – an early Swedish Public-Private Partnership project (Alexandersson & Hultén, 1998), a report comparing the state of the deregulated long-distance passenger markets of rail, bus and air, including a special part on rolling stock in the railway sector (Alexandersson, Hultén & Nordenlöw, 1999), a report on how to establish "competition neutral" conditions between bidders in tenders of passenger rail contracts (Alexandersson, Åbrink & Hultén, 2000), and a historical exposé and analysis of the development of the commuter trains in Stockholm – a revised version of which was published in 2003 (Alexandersson, 2003). All these projects and reports made me dig deeper into the history and background of public transport development in Sweden, and provided much useful knowledge and a better understanding of the causes and effects of both past and more recent events and development. Although none of the mentioned publications appear directly in this thesis, chapters 4 and 6 depend

heavily on this work. Moreover, the underlying work and the contents of the papers were crucial for the production of many later articles and papers.

In 2001, a couple of doctoral courses inspired me to take a look at the development of the regulatory reforms in the Swedish railway sector in a partly different way. Using elements of new institutional economics and organisation theory, I wrote a paper that was selected to be presented at the annual meeting of the International Society for New Institutional Economics in Boston in 2002. The ideas and findings presented in this paper, combined with feedback received at the conference, have been recycled and transformed into one of the concluding sections presented in the final chapter of this thesis.

In 2002, the national authority Rikstrafiken performed a much discussed tender for the night train services between Stockholm/Gothenburg and Northern Sweden. This inspired me and Staffan Hultén to write a debate article published in the Swedish daily *Dagens Nyheter*. This was followed by a new research application to Banverket with the aim of looking into the subject of reasonable and unreasonable bids in tenders. In this research, I dug deeper into the many legal aspects of competitive tendering as well as the extensive literature on auctions and predatory pricing. An article on the subject was published by *Ekonomisk Debatt* (Alexandersson & Hultén, 2003), followed by a much revised and developed English version published in the *European Journal of Law and Economics* (Alexandersson & Hultén, 2006a). This article is also reprinted in this thesis. A follow-up paper, dealing with some general observations on bidding behaviour in tenders of passenger rail services and specifically the occurrence of extreme bids (both high and low) was initiated in 2004 and was subsequently developed into an article published in the journal *Annals of Public and Cooperative Economics* (Alexandersson & Hultén, 2007). This article is also among the ones to appear in this thesis. Another publication to come out of this project (although not reprinted here) is a chapter on competitive tendering in Sweden included in the report book *Competitive Tendering of Rail Services* from a 2006 ECMT/OECD meeting in Paris.

In related lines of research in recent years, I have also been involved in projects aiming at making assessments of the Swedish railway reforms and looking at possible ways forward. This has also meant taking a closer look at the corporatisation of SJ in 2001 and specifically its impact upon railway real estate and the markets for vehicle maintenance. Some of the efforts from this work were published in the book *Reforming Europe's Railways – An Assessment of Progress* (Calthrop & Ludewig (eds.), 2005) and also generated a publication in the *Elsevier* book with selected papers from the 9th Conference on Competition and Ownership in Land Passenger Transport (Macário, Viegas & Hensher (eds.), 2007), in which I also co-wrote an

introductory overview concerning one of the workshops. Again, these fall outside of the contents of this thesis, but are still relevant in terms of my own learning process.

Some more theoretically oriented work, aiming at explaining the logic behind the reforms in Sweden and other European countries, has been presented in the form of an article in a special issue of *European Transport* (Alexandersson & Hultén, 2006b) as well as another article published in *Review of Network Economics* during 2008, which does appear in this thesis.

In 2002, the Swedish National Road and Transport Research Institute (VTI) initiated a new research project regarding competitive tendering in the bus sector. Together with Roger Pyddoke (initially at SIKA, later at VTI) I therefore started to update my data on bus deregulation and tendering in the Swedish local bus services. I revisited and partly revised the empirical material used in the previous study published in 1998 and complemented it with the developments up to 2001. The resulting paper (Alexandersson & Pyddoke, 2003) was presented at conferences in Sweden and abroad. It has recently been reworked and revised into an article to be submitted to *Journal of Transport of Economics and Policy*. In its current form as a working paper, this article is also presented in this thesis.

From 2005, a substantial part of my work has been devoted to Public-Private Partnerships (PPP) in the transportation sector, returning to a topic first examined in the report on the Arlanda Airport Link in 1998. Vinnova has supported this research financially, which so far has generated a report on various models of PPP and some implications for a specific new railway investment in Sweden (Hultén & Alexandersson, 2006), along with a couple of conference papers and the recent publication of an article in *International Journal of Transport Economics* (Alexandersson & Hultén, 2009), reprinted in this thesis.

By the end of 2007 I strongly felt like doing something besides research, at least for a while. An opportunity came up to apply for a position as senior economics adviser at the Community of European Railways and Infrastructure Companies (CER) in Brussels. After a series of approvals (CER, Stockholm School of Economics, my family) I finally moved to Brussels in January 2008. Working as an economics adviser at CER meant dealing not only with economics but also (for example) issues related to infrastructure. In particular, I got to work on topics such as the internalisation of external costs in the transportation sector and infrastructure charging. Although my work was supposed to be that of a lobbyist, I found it useful to take a scientific approach to the development of arguments and facts, the main difference being that the outcome was primarily directed towards politicians and practitioners and not so much to the scientific research community. The period at CER lasted almost a year and – among many other

things – gave me deeper insights and broader knowledge about the development of rail in the whole of Europe, in addition to the related legal and political processes of European Union institutions. Combining this with my previous work helped me produce a new article for the journal *Built Environment* which was published in 2009 and is also reprinted in this thesis.

Returning to Sweden, my work for CER opened up the door to take a more active role in the development of Swedish transport policy, by means of working part-time for the Association of Swedish Train Operating Companies (ASTOC). During my final work on this thesis I have therefore worked part-time at Stockholm School of Economics and part-time at ASTOC.

As a general remark on my research process, a very important part of my work as a doctoral student has been to take part in related seminars and conferences in both Sweden and abroad. Thereby, practically all the work, papers and reports I have been involved in over the years have been publicly presented and discussed in one way or the other. This has been an important source of feedback for my own research and has also provided me with contextual material and references from other researchers. I have also actively taken part in the organisation of two international conferences in Stockholm and several workshops and seminars that have brought both researchers and practitioners together.

Post-research reflections: the researcher as an independent observer or active participant?

After having followed the development of the Swedish bus and railway sectors for 15 years, a couple of post-research reflections deserve to be made.

First of all, I have to acknowledge that my research has been carried out parallel to an ongoing process of reforms and changes in several related industries. This means that when I look at my objects of research today, it is a very different world compared to when I embarked on this journey. This strengthens me in my view of how to perform research and make interpretations. Deductive approaches have certainly been useful in drawing conclusions at certain points in time, but in order to get a better understanding of the process of reforms (and the still ongoing changes!) the inductive approach seems much more appropriate.

Secondly, I find it important to point out that, in retrospect, my role has not only been that of an independent observing outsider. As much as I have tried to take the realist approach in regards to collecting and processing data and information, from time to time, things that I have written and said have

been used, both by me and others, to argue for a certain opinion and provide input to an ongoing debate about the current outcome of the reforms as well as the appropriate way to go forward. Thereby, my conclusions, and not least my interpretations of data and the developments I have studied, have – at least to some extent – become input used to shape and reshape "reality" as perceived by the industry.

To a certain extent this is of course very stimulating and rewarding. Not every researcher is lucky enough to find it easy to make a broader audience interested in their research and influence the direction of reforms and policies. Sometimes, however, I also find all this a bit scary. During my darker moments all kinds of questions pop up: Should my research and opinions really matter so much? Which are my responsibilities when some of this is translated into political decisions and implemented policies that actually affect service operations and the daily lives of people? What if I made a mistake or what if I had said something a bit differently? In particular, it becomes problematic when things you have written and said suddenly assume a life of their own and are used beyond your control (sometimes by people you never even met), without all the usual remarks and reservations.

Two examples can be used to highlight this. In 1997, Staffan Hultén and I had just started to become more interested in Swedish railway reforms. Freight traffic had recently been deregulated and a number of people and organisations were anxious to learn more about what would happen if the passenger market were more liberalised too. We had been granted a rather small amount of money to make a pre-study. One obvious thing to look at – apart from the Swedish development – was the privatisation of British Rail which was just about to be completed in April that year. On very short notice, I managed to book a number of interviews in London (Department of Transport, the Office of the Rail Regulator, OPRAF) and Leeds (researchers at the Institute for Transport Studies, University of Leeds) and went to the UK for an intense one-week trip. In-between my interviews, I also got the opportunity to try first-hand what the new UK rail system was all about. Back home, I wrote a short paper summarising the information I had gathered, including some theoretical thoughts on the reform process and a couple of informative charts. When Staffan Hultén and I put this together in a report (my text appeared in full as an appendix) it was perhaps the very first text in Swedish on the UK privatisation which could claim any scientific ambition. We were invited to present this report to a number of people, including a government committee working on the coordination and organisation of long-distance passenger services. Before we knew it, they had used our material to suggest (in SOU 1997:129) a market-opening of passenger rail services in Sweden! In the end, the committee proposal never made it into an actual

Government Bill, but the idea had been planted and would become a recurrent theme in the years to come.

The other example is a more recent one. In 2007 the government appointed a committee to investigate the possibilities of increasing intra-modal competition in rail passenger services. Staffan Hultén and I were asked to write a report analysing market conditions for a further deregulation of the passenger railway sector. In this report we reached the conclusion that the only way to really make the sector truly customer-oriented was to remove the remaining obstacles for competition on long-distance passenger services. Given that, we also pointed at a number of things to consider in more detail if such a reform was to be carried out, in order to avoid some well-known and also less well-known problems. In October 2008 the committee published its final report (SOU 2008:92), including our work in an appendix and making extensive use of our arguments to propose a liberalised market entry. The remaining issues to be handled were discussed but not that many solutions were presented. Nevertheless, the government quickly (March 2009) presented its proposal for a far-reaching deregulation, including competition on the track, mostly leaving all the problematic issues aside to be solved later or along the way. When we expressed our observation that the process was happening quite quickly (and perhaps too quickly) to an official at the Ministry of Enterprise, Energy and Communications, he just smiled and responded: "You got what you wanted – aren't you happy?"

Consequently, I believe that what really matters is that a researcher acknowledges that their work is unlikely to occur in isolation, disconnected from the phenomena and subjects being researched. Having this clear in mind should make the researcher more thorough, meticulous, careful, and – last but not least – humble. If anything, this is what I have been trying to be for the past 15 years.

3. Theoretical framework

In this chapter I present the overall theoretical framework of relevance to my research and the essays included in this thesis. The first part includes a brief presentation of the broad theoretical fields devoted to studies on regulations and transportation. The second part then takes a closer look at some more specific theoretical approaches and concepts, providing, among other things, the principal arguments for why regulatory change may become necessary, what form it may and should take, and why it actually occurs and takes a specific direction. Different elements of theory have been presented and applied in the various essays, and I will elaborate more on some of them in the concluding chapter.

First, however, it is necessary to clarify some of the concepts to be used. For a start: what do we actually mean by *deregulation*? In its original sense, deregulation is supposed to refer to the phenomenon of public policy makers and/or legislators simplifying the regulatory framework governing any firm operating in or wishing to enter a certain market. Sometimes this can imply the actual removal of regulations, such as price regulations, thereby really leading to a state of less regulation. In Sweden, as with many other countries, the concept of deregulation has often come to be used in a broader sense, referring to any change in the regulatory framework that would make it easier for new entrants, thereby stimulating competition. Also, as has been recognised by many scholars, all markets require some "rules of the game" to function properly. Even far-reaching deregulations are commonly linked to the establishment of new rules and legislation in order to foster a competitive environment. It may even be that additional rules or regulations (i.e. *more* regulation) are necessary to avoid the negative effects of competition, to make sure that all companies face similar conditions or to reduce certain uncertainties (for example clarifying what is allowed and not allowed for a firm that dominates a market). Sometimes, the word *liberalisation* is used instead of deregulation to highlight such circumstances, but the terms are often used interchangeably.

Thus it follows that it may sometimes be better to talk about *regulatory reform* or *regulatory change* than deregulation,[4] although it will then be necessary to simultaneously point out that these reforms and changes specifically aim at the creation of a more competitive environment for the firms operating in a certain market. Consequently, using the term

[4] In Swedish, the term "omreglering" usually comes up, but there is no simple corresponding term in English. It should not be confused with the English term "reregulation", generally referring to a situation where a previously deregulated market is again becoming more regulated, even revoking some previous changes.

"deregulation" can still be the simplest way to express what kind of issues are to be discussed, although it is not always the most precise.

Closely connected to deregulation is *privatisation*. In a traditional sense, privatisation may primarily refer to the government or other public bodies selling firms or assets to the private sector, thereby reducing public ownership. Privatisation typically also presumes that in the process, these businesses will be subjected to regular market forces (although this may require several other measures). As will be discussed further below, privatisation can take several other forms. In Sweden, the term has commonly been used to describe the introduction of public procurement by competitive tendering, or *contracting out*, and any other process that leads to increased market shares of private firms in industries that previously have been dominated by the public sector. In a way, this can be somewhat confusing, as procurement (buying) might even be considered the opposite of selling (privatising) services or assets. The important thing to note is that an increased role of the private sector can be the result of a number of measures.

Finally, it needs to be pointed out that there are important differences between, for example, laws, regulations and directives in terms of their legislative power, but in this thesis I have rarely made such distinctions. Rather, I have considered all to belong to the set of rules that jointly form the overall regulatory framework. Sometimes industry praxis and conventions need to be considered part of the regulatory framework, if they maintain the same kind of influence as more formal rules.

Theoretical fields studying regulations and regulatory change

Studies on regulations and their impact on industries have been particularly common in the field of research called *Industrial Organisation (IO)*. The field builds upon ideas and concepts from primarily microeconomics. IO may roughly be divided into one empirical and one theoretical tradition. Until the 1970s IO was dominated by empirically focussed studies of industries and comparisons between industries, often based upon secondary data. One important analytical model in this type of studies is the so-called SCP model (*Structure-Conduct-Performance*). The basic concepts of this model were formed in the 1930s before being further developed by researchers such as Mason and Bain, to mention some important contributors. The basic idea of the model is that society strives for every industry to achieve results that are socio-economically efficient, as exemplified by a number of performance variables. This is affected by the conduct of the actors in the industry, and this conduct is explained by the characteristics of the market structure, for

instance in terms of the number of sellers and buyers and entry and exit barriers. Ideally, a good socio-economic performance should flow from the market structure and the conduct it fosters. When this does not happen in and of itself, actions in the form of public policy, including different types of regulations, must be taken. Scherer & Ross (1990) summarise the variables and dependencies that tend to be in focus in this type of studies. In order to highlight the importance of the legal framework as well as other factors affecting industry market structure, the original SCP model has been expanded with the concept *Basic Conditions*.

Even if the more theoretical branch of IO may be traced back to the 1940s, it wasn't until the 1970s that it started to grow in attention and importance. Growing discontent with the limitations of the empirical analyses of cross-sectional data that had come to dominate IO, led to the entry of a game-theoretical approach. While traditional SCP analysis uses a certain industry or sector as its unit of study, game theory puts most of its efforts into studying the company level. One result of the impact of game theory is that IO has shifted in character, from a field dominated by empirical analysis with a rather loose theoretical base to a strong theoretical field with a relatively limited interest in empirical applications (Carlsson & Lundvall, 1998).

IO as a whole is sometimes viewed as one of two branches of what is called *Industrial Economics*. The other branch of the field is *Industrial Dynamics* (ID). While IO focuses on static analysis of microeconomic issues, the research within ID is primarily interested in issues related to economic and technical development and change. The pioneer of the field is Joseph Schumpeter, but its development and increasing importance in recent years draw from the works of e.g. Dahmén and Nelson & Winter. Focus is upon discerning the driving forces behind economic and structural change and understanding the actual process of change, not only its results. Since processes of change are considered in a broader context (historical, institutional, technological, social or political), drawing from other disciplines is often rewarding. One characteristic of the ID field is that the unit of analysis varies depending on what is viewed as the current problem. Sometimes firms are important objects of analysis since they may be the bearers of change or because changes take place within them. In other cases it is more interesting to study a sector, or the system in which the firms are active. On the one hand, what firms do may influence the dynamics of the larger system; on the other hand, firms are influenced by and respond to changes occurring at the system level, for instance macroeconomic and institutional changes (Carlsson & Lundvall, 1998).

While there is a vast literature on public policy and regulations (within as well as outside of the IO domain) that looks at the regulation of so-called public utility sectors, it is difficult to point out a specific theoretical field that

covers regulation of transportation in particular (Carbajo, 1993, and Button & Pitfield, 1991). However, regulatory changes have long been a topic of interest in *Transport Economics*. Articles in this field are based upon microeconomic theory, but those on regulatory changes are often positioned rather loosely in a theoretical sense. The focus of interest lies upon empirical analysis of actual effects from regulatory changes in terms of market structure, costs for society, patronage and technical development. Thereby, most of the studies on actual deregulations in transportation markets are found within this field.

From regulation to deregulation – theoretical approaches and concepts

Market failures vs. regulatory failures

During the past 30 years, views upon regulation and intervention from the state have changed considerably. The main argument for regulations is that they are necessary to avoid the problems related to competitive markets. The study of different causes of *market failures* produced a fair amount of research up to the 1960s. However, towards the end of the 60s and in the early 70s, the view that regulation is important to protect common interests became the target of an increasingly fierce criticism.

Attacks in the form of new theory came from representatives of the so-called *Chicago* and *Public Choice* schools. Stigler (1971) and Peltzman (1976) developed models showing that government intervention in some cases could be more harmful than actual market failures. As a counterweight to the notion of market failures, the concept *regulatory failures* was coined. It was argued that regulations could hinder innovation and progress. One key argument was that regulations and regulators could become "captured" by those they were aimed at controlling. In other words, firms already present in an industry might be able to manipulate regulations in order to gain advantages. One reason would be that these firms often have superior access to information on costs, demand and technical development, and may present this information in a (for them) favourable light to the regulators. On a more general level, producer-interests tend to enjoy a favourable position as demanders of regulation due to relative ease of organisation, compared to the large number of buyers.[5]

[5] Peltzman (1989) provides a thorough discussion of Stigler's propositions and other strains of theories on economic regulation. Posner (1974) makes a critical review and analysis of the various theories typically used to explain the patterns of government regulation.

To conclude, one may say that from the mid 1970s it was evident, from theoretical as well as empirical studies, that regulation does not come free of charge. In the transportation sector this had become very apparent: public spending on subsidies to uphold non-commercial services had grown in several countries. A specific line of thought was that there was a need to get rid of some old layers of regulations that had been added upon each other over the years, following constant amendments and changes. Steiner (1983) called it a "cumulative clogging of the pores". By at least temporarily letting the market forces play more freely, it would be possible to find out which regulations were really necessary.

Theories on public and private ownership and contracting out

Deregulations and other regulatory reforms are commonly linked to market transitions that involve privatisation, the transfer of public ownership and management to the private sector. According to Vickers and Yarrow (1991) privatisation of former public enterprises and services can take three forms: 1) Privatisation of competitive firms – the transfer to the private sector of state-owned enterprises operating in competitive markets, 2) Privatisation of monopolies – transfer to the private sector of state-owned enterprises with substantial market power; these firms can either be natural monopolies (like electricity transmission) or "artificial" monopolies, where competition from foreign or domestic firms could exist, 3) Contracting out of publicly financed services, previously performed by public sector organisations.

The economic motives for privatising a public monopoly compared to replacing a public monopoly with competition are quite different. There is a widespread agreement amongst economic researchers that the replacement of a public or publicly guaranteed private monopoly with competition between competing firms results in improved efficiency. These gains in efficiency are less clear for the transfer of a public monopoly to private ownership. In this case, it seems that the regulatory policy is crucial for preventing negative effects of monopoly power (Vickers and Yarrow, 1991; Alexandersson *et al.*, 1998). The motives for selling a public monopoly are rather to be found in the need to find revenues for the public sector or avoiding public spending in the future. One must also consider the distinction between productive and allocative efficiency. Competition generally fosters gains in productive efficiency, for example through increased labour productivity, while a transition to a state of better allocation of resources and optimum output may be less straightforward and take longer time (see e.g. Preston, 1996).

Some monopolised markets may be better suited to the introduction of competition for the market (for example by means of tendering), rather than

competition in the market. In theory, this is advantageous when some resources of production are fixed or otherwise limited in terms of capacity, making them difficult to be used by more than one firm at a time (for example a time slot in a railway timetable), when there is a need for coordinated planning of production in order to make use of network effects, and when many competing companies would create a fragmented and possibly irregular supply over time – making it difficult for consumers.

As a special case in the movement towards an increased role of private sector ownership and involvement in several markets, so-called Public-Private Partnerships (PPPs) have attracted much attention in recent years as possible means of handling large and costly projects, such as the construction of new infrastructure. While a driving factor behind the setting up of these projects has often been the constrained national budgets of many countries, a PPP should ideally try to combine the advantages of the public sector with those of the private sector, finding a superior solution to an entirely public or entirely private project (Välilä, 2005, p. 100).

Scale economies, natural monopolies and contestable markets

The existence of scale economies in transportation services has been a recurrent topic in discussions related to regulatory changes, and has often had an impact on both the type of reforms implemented as well as the speed of implementation. Before any regulatory reforms took off in Europe, it was widely believed that scale economies in the bus industry were not of great importance (see for example Lee & Steedman, 1970). Following the trends towards concentration and the creation of very large bus companies in the wake of e.g. the British bus deregulation (and in Sweden as well), several researchers have argued that scale economies are in fact important, at least in terms of purchasing and planning. The introduction of competitive tendering in the bus sector made these scale economies visible and possible to exploit, while firms had previously had very limited possibilities to grow at all. Even minor firms have sometimes been able to make use of scale economies by means of common purchasing and bid calculation (Alexandersson & Alexandersson, 1995).

In the railway industry, presupposed scale economies in production, marketing, purchasing and co-ordination, long implied that the provision of vertically integrated railway services was by definition viewed as a “natural” monopoly (see for example Beesley & Littlechild, 1992). Even Friedman (1972, p. 42), implicitly assumed that the railways were a natural monopoly when he wrote that a private monopoly of a technical monopoly, for example the railways, was better than a state monopoly or a regulation because a

private firm will react faster to technical and societal change than regulated firms or public monopolies. Today, it is primarily the rail infrastructure that continues to be viewed as bearing characteristics of a natural monopoly, forming the basis for vertical separation of infrastructure from operations in several European countries. However, there is a persistent debate concerning the merits of vertical separation versus integration. Preston (1996) shows that the economic evidence for vertical separation is not entirely convincing. For example, there may be economies of scope related to vertically integrated planning of infrastructure and operations. It is possible that some scale economies in the European railway sector, which might have been possible to exploit before, are no longer available due to asset stripping and the separation of previously integrated businesses and lines. Some researchers have therefore argued that vertical separation should never have been applied at all (see e.g. Bruzelius, 1998, and Ehrmann, 2003), while for example Stelling (2007) in her study of the Swedish model of vertical separation concluded that the impact on costs from an increased competitive pressure more than compensated for the negative cost effects from vertical separation.

In addition to the discussion on the pros and cons of vertical separation, there has also been a long-lived debate concerning the importance of various types of scale economies in railway operations. Empirical evidence from the U.S. suggests that there are constant returns to scale, but increasing returns to density in the railway sector. In other words, a railway company may only gain from running more trains on its existing network of lines, rather than both increasing the number of trains and expanding the network. Studies performed in Europe provide a more complex picture. According to Preston (1996), there are important economies of scale in network operation, but there is probably also an optimal size above which diseconomies set in. The smallest operators in Europe are affected by increasing returns to scale, the medium-sized operators experience constant returns and the largest appear to be affected by decreasing returns to scale. However, almost all railway companies, regardless of size, exhibit increasing returns to density (Preston, 1996). There are several possible sources of these economies, for example, increased levels of service may lead to better use of terminal facilities, rolling stock and labour. But in the end, these economies may reach a point of exhaustion and thus diseconomies of scale start to become apparent. This may be due to increased agency costs as companies become very large and – possibly – more difficult to manage and control.

It is important to note that this discussion on scale economies is limited to the effect of size upon variable costs. If demand-side complementarities are weighted in, such as co-ordinated timetables and marketing, the case for large railway companies probably gets stronger. However, very large firms may

also have greater difficulties than small to respond quickly to shifts in customer needs.

While most U.S. railroads are focussed on freight, European railways have traditionally been involved in both passenger and freight operations. This raises the question of economies of scope between passenger and freight operations. Although empirical findings are not entirely consistent, there is evidence of diseconomies of scope from studies on European as well as Japanese railways, suggesting that passenger and freight services may gain from being separated (Preston, 1996).

The existence of scale economies in railway operations has sometimes been used to defend a regulatory framework that maintains a close-to-monopoly position of national operators in some European countries. But it has also been argued that scale economies are not automatically advantageous to these operators. Rather, they need to be exploited, and firms may very well differ in their skills at doing that. Large incumbents, unaccustomed to intra-modal competition, may previously have experienced a rather limited pressure to rationalise their operations, especially if it had been easy to get additional subsidies from the government or other public authorities (Alexandersson *et al.*, 2000). In theory, the introduction of a more open and competitive market should reveal any actual economies of scale, enabling the most efficient firms to grow to their optimal size.

Related to the discussion on scale economies, there is an important theoretical contribution to consider regarding how competition influences markets. By conducting studies of the preconditions for when monopoly firms may actually be good for society, William Baumol and other researchers came to formulate a theory on a new type of idealised market, *the contestable market*. Such a market is characterised by possibilities for easy and fast entry and exit of firms, which should all be affected by the same regulatory framework and have equal access to market knowledge and technology. Scale or scope economies may exist, but this is not a necessary condition. *Sunk costs*, rather than scale economies, make up the barrier to entry that gives a monopolist harmful power. The implications are that an industry may be efficient even in the case of a monopoly or oligopoly, provided that the *threat* from future competition is considered to be real. Regulations should therefore aim at facilitating entry and exit (Baumol, Panzar & Willig, 1982). Similar ideas on the importance of the threat of competition for the efficiency of monopoly firms may be traced back to Schumpeter (1943/1976).

Transaction cost theory

Another theoretical development that has had an impact upon the actual implementation of regulatory changes in the transportation sector, in particular in the railway industry, concerns transaction costs. The costs of carrying out transactions depend on the frequency of the transaction, uncertainty, the degree of specificity in the investments, and the perceived need to insure against opportunistic behaviour in markets with few actors (Williamson, 1981). As can be understood from these factors, any change in a market structure may result in opposite forces as regards the transaction costs. A reduced uncertainty in the price level when using the market can be off-set by co-dependence between buyers and sellers if there is a high degree of investment specificity.

When the former railway monopolies were dismantled in countries like Great Britain and Sweden, transactions that used to be managed internally were moved to a market with sellers and buyers. This type of shift has been interpreted in two contrasting ways by researchers. One group claims that the horizontal and vertical disintegration resulted in lower transaction costs because the transactions were made visible and exposed to market mechanisms. Inspired by Hayek and others of the Austrian School, one of the architects behind the privatisation of British Rail claimed that the separation of large vertically integrated firms into smaller specialised units led to positive effects in terms of increased specialist knowledge at these firms (Foster, 1994). This division implied that a number of new contracts between the units had to be set up. Although the number of transactions in the system may have increased, the argument from this interpretation of transaction cost theory was that this does not necessarily imply higher transaction costs. In addition to the argument that transparency makes transactions efficient, it has also been claimed that modern methods of management and control, auditing and computerisation decrease the costs of every transaction and make it easier to formulate the division of responsibility in contracts. Therefore, a clear separation of businesses into separate firms is necessary.

It is important to note that one precondition of this line of reasoning is the exposure to market mechanisms, which is not always easy to achieve, and has even been forgotten in some regulatory reforms involving disintegration. When splitting large railway companies into smaller units, some of them may become monopoly firms (such as providers of railway stations). Moreover, it can be argued that learning and efficiency gains are also linked to having several customers with partly different needs. If the companies of the new system are only serving the very same divisions as before – and perhaps only one each – the gains from separation could turn out to be minor at best. Another potential concern is that if the monopoly is broken up into many sub-

markets for inputs as well as for operations, the post-deregulation industry may contain so many firms in each market that transaction costs will inevitably increase. For example, the British railway industry was broken up into more than 80 firms. To reduce the potential risks associated with breaking up a monopoly one may consider increasing the size of the average tendered business operation and to construct upstream markets that are not so specialised – for example by merging different activities into one market.

Some of those that oppose the supposition of lowered transaction costs highlight the high asset specificity in the railway sector. They suggest that there is no such thing as an optimal way of organising competition in industries that have to rely on (monopolised) network facilities, and there is now a growing concern that the wrong design of the industry's basic structural framework may have been chosen in the early days of the European regulatory reforms (Hultkrantz, Nilsson & Karlström, 2005). One possible source for increasing transaction costs that may be more important than gains from competition is the misalignment of the mode of organisation. Misalignment refers to an arrangement in which the characteristics of the mode of organisation do not fit the attributes of the transaction it has to organise. This problem can occur in any new market constructed after the deregulation of a former monopoly (Yvrande-Billon & Ménard, 2005).

Auction theory [6]

The liberalisation of the European transportation markets has typically involved the introduction of public procurement of bus and railway services by means of competitive tendering, also known as a franchise bidding framework (as developed by Demsetz (1968), as an alternative to regulation of natural monopolies). In a competitive tender, a bidding firm or a consortium promises to supply a service at a defined quality level, and simultaneously states its price (the subsidy needed) for this, or (when revenues can be expected to exceed costs) how much it is prepared to pay for the right to supply the service if granted some exclusive rights. Therefore, using competitive tendering when contracting out a public service is similar to performing a common value auction with a sealed-bid procedure. However, the price of the bidders may not be the only factor (although it is often the most important) to take into account. The procuring public authority typically evaluates the competing bids regarding both price and quality. Hence, competitive tenders combine the traits, advantages, disadvantages and risks of both auctions and beauty contests. The relative merits of pure

[6] The use of auction theory as a way to understand the behaviour and outcome in competitive tenders is developed much further in two of the essays included in this thesis.

auctions versus beauty contests have been much debated in auction theory. For example, Hultkrantz & Nilsson (2001) claim that a pure auction is better than a beauty contest because it offers a more market-oriented, objective and transparent method for awarding licences. Their strongest argument in favour of auctions is that firms in the auction process, by means of offering more and more money, reveal information about their estimation of the value of the good. They further suggest that, even when social concerns are important, an auction is a better alternative since it can also include minimum requirements and can allow both positive bids in attractive regions and negative bids in unattractive regions.

But auctions also present some notable risks and potential disadvantages. In many auctions, as well as in many competitive tenders, firms have made unrealistically optimistic forecasts about future revenues and costs. In auction theory, the concept of *the winner's curse* is used to explain why winning bids may be based upon judgmental failures. In particular, common value auctions – in which the participating bidders value items differently based upon their judgment of uncertain prospects – tend to be won by the bidder with the most optimistic estimate of the item's value (see e.g. Kagel & Levin, 1986). Adnett (1998) discusses the winner's curse in relation to such tendering procedures. He argues that a low number of bidders – and in particular if they are inexperienced as during the first round of tendering in a particular sector – will increase the likelihood of the winner's curse in competitive tenders. One way to limit the problem of the winner's curse is to alter the auctioning procedure. An open English auction, in which the bidders continuously follow the bids of their rivals, may stimulate aggressive bidding but yet decrease the risk of too optimistic bids and the related winner's curse (Milgrom & Weber, 1982). However, there is an increased risk of collusion in open auctions (see e.g. Robinson, 1985). It should also be noted that the winner's curse in tenders of public services may also be related to the bidders' attitude towards risk, for example their view of whether the government will be willing to bail them out or renegotiate the contract if they fail. There may also be entirely strategic reasons for placing bids at certain levels in competitive tenders.

Theories on institutional change, path dependency and diffusion

Regulatory reforms may be viewed as processes of institutional change, and thereby possible to analyze by means of ideas and concepts from the field of New Institutional Economics (NIE). According to North, institutions are the rules guiding, directing and constraining the choices and actions of economic agents (primarily organisations). They may be formal, like laws or regula-

tions, or informal, like norms of behavior (North, 1990, 1993). In the text at hand, formal institutions attract the most interest, especially the ones with implications for competition in respective industries.

Organisations induce change, and North stresses that institutional change is often incremental by nature (North, 1990, p. 89). Incremental change comes from the perceptions of entrepreneurs in political and economic organisations that they could do better by altering the existing institutional framework (North, 1990, p. 8). Consequently, institutional change can be considered the result of interplay between those demanding and those supplying institutional change (Alston, 1996, p.27ff). In order to understand institutional change one has to identify those with demands as opposed to suppliers, and reveal the relative power between and among them.

In NIE's original form, it is assumed that institutions are endogenous to individual demanders and suppliers, and are in constant change due to the on-going renegotiations between them. Alston adds to this view by formulating three "pure cases": 1) institutional change as endogenous to the system but exogenous to individual demanders and suppliers, 2) institutional change as endogenous to certain demanders, and 3) institutional change as endogenous to the suppliers (Alston, 1996, p.27ff). Setterfield (1993) criticizes these views, mainly by adding the time factor, stating that institutions tend to be exogenous for the actors in the short run, but endogenous in the long run, implying institutional stability punctuated by short periods of substantial change. There may be a constant pressure for change, but this is to some extent counterbalanced by inertia and conservatism.

North (1990) makes use of the concept *path dependency*, originally developed by Paul David (1985) and W. Brian Arthur (1989) to analyze the importance of historical events on technological change, in order to describe the character of some institutional changes. Some researchers have chosen to use the label path dependency to describe a certain development whenever it could be argued that "history matters" or sometimes only "circumstances matter".[7] This "weaker" form of path dependency may be a useful analytical tool in a number of cases, while in its stronger (original) sense, path-dependency theory implies that once a choice has been made, a specific path is followed due to increasing returns. In particular, the theory argues that this may lead to non-optimal outcomes.

Institutional change, and in particular the diffusion of reforms and beliefs, has also been of interest to advocates of the so-called neo-institutional organisation theory. As e.g. Brunsson & Olsen (1993) argue, firms and other

[7] Magnusson & Ottosson (1997) review the literature on different degrees of path dependency and the possibilities for handling them within neo-classical economics. Ottosson (1997) finds it useful to explain differences between countries by means of referring to different path-dependent circumstances.

organisations tend to implement reforms and business practices that are commonly viewed as modern, rather than being designed for their particular business. One important reason can be that this is deemed necessary to stay legitimate, especially if the organisation has an unclear output that might lead to difficulties in legitimizing its existence.

Proponents of neo-institutional organisation theory challenge the "traditional" belief that rational-instrumental explanations are the most important initiators and drivers of reform, adding the perspective of the institutionalized environment as an important alternative or complement (Brunsson & Olsen, 1993, p. 10ff). This environment is characterised by significant long-term trends and short-term fluctuations in fashion or swings between different ideals. Modernisation is one such long-term trend, while the focus on organisational efficiency in the 1980s (representing a shift from a focus on democracy in the 1970s) can be viewed as having a (relatively) more short-term impact. The latter has influenced the attempts to reorganise the public sector, aiming for more competition and adaptation to market forces, using an idealized picture of the private enterprise as a model. Brunsson & Olsen (1993, p. 10, 194) point out that this institutional environment means that reforms may vary in terms of acceptance, in effect limiting reformers to choose reforms that are believed to be modern and in fashion.

A new practice or way of organising a business once developed in a certain setting (such as the clustering of high-tech firms in Silicon Valley) or by a certain company (such as "lean production"or "just in time" with Toyota) may, if it gains a reputation as successful, diffuse to other settings and companies. This diffusion can take place by means of simple imitation between organisations, which is facilitated by their degree of isomorphism (see for example Dimaggio & Powell, 1983, for a discussion on institutional isomorphism and the role of imitation). More importantly, "theorization", a process which turns the practice into an institutionalized model, can increase the pace and scope of such diffusion of practices substantially (see for example Strang & Meyer, 1993). Some modern business practices get to spread very quickly, almost like fads, but may also become irrelevant or be abandoned equally quickly. Whenever a new practice is on a roll, it can be very difficult for an organisation *not* to consider it for implementation, regardless of its real values for the actual organisation. Managers may actually need more arguments to defend a position of avoiding a practice than it would take to simply embrace it. One strategy for dealing with this problem is to promise to implement the practice in the future or only implement it "on paper", which may be viewed as a form of *decoupling* of structures from activities (Meyer & Rowan, 1977).

Brunsson, Forssell & Winberg (1989) and Brunsson & Olsen (1993) use the case of SJ to illustrate how organisations may seem to be constantly reforming themselves, and sometimes there is a recurrent theme in all these reforms. SJ has a long history of trying to become more "business-like" by way of implementing reforms and new practices. According to Brunsson & Olsen (1993, pp. 41), initiating new reforms, especially when similar to the ones already tried in the past, is facilitated if there is a mechanism of organisational forgetfulness, such as avoidance of keeping the same management in place for longer periods of time and allowing new people and consultants to enter the organisation. While initiating reforms may be a rather easy process, implementation often reveals the underlying problems and difficulties of an organisation's businesses, which leads to many reforms being only half-way implemented or sometimes only implemented by way of a revised organisational chart.

Summary and implications

As is evident from the discussion above, the concept of deregulation covers a wide array of public policy measures and draws from several theoretical fields of different origin.

In the overall sense we are discussing measures that aim at creating more efficient markets, primarily by means of increasing competition. As the industries of interest here are ones that long have been subjected to state intervention and public ownership, deregulation will typically focus on a transformation to a market characterised by more private-sector involvement.

Both competition and private-sector involvement may take many different forms. We may open up markets for competition where firms are competing directly and on strictly commercial terms, or we may create (or keep) an additional level of public authorities that take an overall responsibility for the provision of services to end customers, while introducing competition at the operating level by means of competitive tendering. Increased private sector involvement may come through privatisation schemes such as selling off national firms and assets or by stimulating entry from the private sector through tendering procedures. We may also enter into long-term public-private partnerships where private capital becomes an important part of the creation of new infrastructure.

Consequently, the related theoretical discussions concern why and how change and regulatory reform is taking place under different circumstances. Much of this is discussed in normative terms. In addition to this, a number of specific questions have been of interest to researchers: What are the boundaries of reforms? Will economies of scale and/or scope have a relevant impact? Are there parts of the market that should be stashed away from the

market forces, due to their character of natural monopoly? How will firms behave under the new regulatory structure? Do we need to put special restrictions on former monopolists in order to stimulate a more competitive environment? Do we need to create artificial markets for certain resources or implement some form of price regulation? Will such measures introduce a risk of sub-optimisation?

In terms of impact on my thesis, the early parts of this chapter, presenting the theoretical concepts and approaches like market and regulatory failures, theories on public and private ownership, scale economies, natural monopolies and contestable markets, and transaction cost theory, have all served to provide me with a better understanding of why deregulations and reforms aimed at increased private sector involvement have come to be important parts of public policy in the transport sector. These theories have all – to a various degree – provided arguments for the direction of reforms and their implementation, and constitute important background references for most of the articles reprinted in this thesis. They come to prominent use in the paper on privatisation and competitive tendering in Europe as well as the paper on the Swedish rail deregulation path. The theories on scale economies are brought up by the two papers on bus reforms as well as by the two papers on predatory bidding. Auction theory is directly used (and developed) in the two papers on predatory and abnormal bidding patterns. The theories on public and private ownership are brought up in the papers on bus tendering as well as the paper on PPPs in the transport sector.

Theories on institutional change, path dependency and diffusion are not directly used by any of the articles included here, but rather serve as a basis for the discussion in the concluding chapter about the driving forces behind reforms – and the sometimes unexpected results of certain reforms.

4. Contextual development I: International experience

From the early 1970s and onwards, many countries have implemented reforms aiming at deregulation and privatisation in industries where regulation as well as public ownership and operation used to prevail. The transportation sector was often an early target for such actions. In this chapter I will take a closer look at some of the international experience of regulatory reform in the transportation industries, forming the first part of the contextual development to the Swedish case.

European Union reforms

The directive 91/440, on the separation of accounts for infrastructure from operations, was one of the earliest initiatives of the European Community regarding reforms in the railway sector. This directive has sometimes functioned as a starting point for railway reforms in the Community member states. In countries where tendering of railway services has been introduced, general EU directives on public procurement and European competition law have also played an important role.

Gradually, the European Union has developed a political agenda to promote the advancement of the railways, but many countries have been very slow to actually follow these objectives. The current European Union railway policy includes the following goals (Lundström, 2004; European Commission, 2001, 2002): 1. Create a common market for railway transportation services, 2. Achieve operational compatibility in order to overcome the different technical standards of the member states, 3. Create a common market for railway material and equipment, 4. Create equal conditions for competition between different modes of transportation, and 5. Support sustainable development by means of stimulating modes of transportation that have less (negative) environmental impact (such as railway and water-bound transportation).

During the past decade, the European Commission increased its efforts to make these goals more tangible, expressed by its work on several “railway packages”. The first railway package was accepted in 2001 and included the decision to open up international freight services on a specified network of lines or corridors in 2008. Also, it would no longer suffice to separate infrastructure from operations only on the accounting level. The second railway package was agreed upon in 2004. In order to hurry on with the liberalisation of freight services within EU, both international and domestic

rail freight markets were to be opened for entry on January 1, 2007. In 2004, the European Commission also presented its proposal for a third railway package, finally agreed upon in 2007. An important part of this package was Directive 2007/58/EC, stating that the international passenger services within the European Union were to be opened up to competition no later than January 1, 2010. Accordingly, all companies that fulfil safety regulations and other requirements should now have open access to the railway infrastructure. This also includes the possibility of cabotage, implying for example that an international passenger train going from Copenhagen to Stockholm would be allowed to pick up and leave domestic passengers along the way. It is however possible to limit the impact of this directive in instances where nationally procured services (considered to be of public interest) could otherwise be economically hurt. As of today (mid 2010), the directives and regulations following from the first railway package have only partially been implemented throughout the European Union. In 2008 and 2009 the Commission therefore took several initiatives to formally complain about this to the affected member states (see for example SIKA, 2009, for a detailed overview).

The Commission has for several years been planning for a revision or "recast" of the first railway package, in order to create a more coherent and unified legislative framework as well as address some of the issues that are believed to hinder the development of an open and competitive rail market. Such a recast proposal can be expected in September 2010. Also, there is work going on to bring forward a proposal (from 2012 to 2010) to open up domestic passenger services to competition in a more general way. This could happen either as part of the recast proposal or by means of a separate proposal. Moreover, the Commission is expected to present a new White Paper on EU transport policy by the end of 2010.

Parallel to the development of the railway packages, there has been a long process to reform the old Community regulation 1191/69, which has aimed at providing a coherent framework for when and how passenger services may be subsidised or given exclusive rights. This regulation was revised in 1991 (regulation 1893/91) but failed to mention market opening or how to award public-service contracts. The development in several European countries during the 1990s involving the introduction of competitively tendered bus and rail services and the rise of international transport operators, highlighted the need for new regulation. In 2000, the Commission came up with its first version of a proposal, but it was not until late 2007 that a compromise agreement could be reached between the Council and the European Parliament (see Van de Velde, 2005, 2008, for an extensive review of this process). The new regulation (1370/2007) on public passenger transport services by rail and by road, which came into effect in December 2009, is

built on the basic principle that when authorities intervene to realise public-service obligations, they must compensate operators for their costs and/or grant them some exclusive rights, and all these obligations must be established and clearly defined within the framework of a contract. While early proposals had favoured nearly compulsive competitive tendering for the award of public service contracts, the compromise regulation takes a much less dogmatic view. Competitive tendering (which must be open, fair, transparent and non-discriminatory) is still considered the standard way to award contracts, but there is now also the possibility for authorities to provide public transport services by themselves, or to award them directly to an internal operator. However, this possibility of directly awarding contracts internally comes with a limiting reciprocity rule implying that such an internal operator must not engage in other passenger transport activities outside its awarded territory. Direct award is also possible for all rail services (with the exception of metro and tramways), but such contracts may then not exceed 10 years.

In all, this new regulation on the awarding of public-service contracts is not exactly in line with the efforts to further liberalise the European railway sector as suggested by the third railway package. Moreover, the regulation's principles on awarding procedures (when tendering is used) only apply to procured services that are to be viewed as concessions. Contracts that imply limited or no commercial risk for the operator have to follow the awarding procedures defined in the more general directives on public procurement. Therefore, national interpretation and policies will probably play important roles for the further development.

Among European Union member states, Great Britain has implemented the most far-reaching reforms in the railway sector. Sweden has also gone a long way in its step-by-step incremental approach, while countries like Germany and the Netherlands have applied a "wait and see" incremental approach (in tune with EU legislation). France is among the late compliers. An overview and interpretation of how far rail liberalisation has actually progressed in the European Union member states is provided in reports of the so-called rail liberalisation index (Kirchner, 2004). An overview is also presented in the article "Rail Privatization and Competitive Tendering in Europe", reprinted later in this thesis. Although all EU countries have embarked on the process of restructuring and liberalising their rail industries, it is clear that there are many differences as to the pace of implementation and the impact of the reforms so far.

It should be noted that, in contrast to the railway sector, initiating reforms in the bus sector has not yet been singled-out as a goal for any European Union initiatives. Rather, general reforms concerning competitive tendering and the awarding of service contracts have played a role (as discussed above).

Great Britain has been the pioneer in the reformation of the bus sector, closely followed by countries like Sweden, Finland and Denmark. Both Sweden and Finland initiated and implemented reforms in this sector several years before even joining the EU.

Since Great Britain paved the way with its reforms in the bus sector in the 1980s, later followed by the most radical approach to reform in the railway sector, this country has on several occasions been looked upon as a role model for subsequent reforms in many other European countries. Britain's role as trailblazer has been interpreted both positively and negatively, and has for example provided empirical evidence leading to theory development on less desirable ways to design various reforms. In any case, Great Britain's approach to transport reforms certainly deserves to be treated in more detail in order to establish the context to the Swedish reforms. This is the purpose of the next section. In a later section we will also take a closer look at the somewhat contrasting development taking place in the US railway sector. The United States pioneered the deregulatory movement in the 1970s in general, and the application in the railway industry in particular.

Great Britain

When the Conservative government was elected in 1979, the transport sector became an early target of its policy of deregulation and privatisation in industries where public intervention long had played an important role. A deregulation of the express-coach industry was implemented as early as 1980. In 1986 the deregulation of local and regional bus services followed. In 1994, after having been the subject of much debate during the 1980s, the process of deregulating and completely privatising the British railways was initiated.

Bus deregulation

The deregulation of local bus services in Britain meant that private bus companies became free to start scheduled bus services on a commercial basis wherever they wished, including the freedom to determine time-tables, fares, vehicle types etc. Routes that were considered to be commercially unprofitable, but still of public interest, were subjected to competitive tendering by public procurement.

A different approach was taken in London. The responsibility for the co-ordination of the bus services remained in the hands of London Regional Transport, which gradually subjected these services to tendering. This approach, with a preserved public responsibility for the co-ordination of the services, is very similar to the way the Swedish deregulation was designed.

The political intention for London however, was that public transport services should be fully deregulated in due time.

Several studies have reported on the results of the British deregulation. One of the most-cited positive effects is the appearance of innovations such as mini-buses replacing standard-sized buses on some routes. Partly thanks to such innovations, the productivity has improved, if measured as costs per bus kilometre (see e.g. Heseltine & Silcock, 1990). According to the Department of Transport, between 1985/86 and 1993/94 there was a 40 per cent decrease in costs per bus kilometre, while the supply of bus kilometres increased by about 25 per cent.

Still, the economic effects of the British deregulation as a whole are considered to be questionable, and some researchers even call the deregulation a failure. Demand has decreased by about 25 per cent, despite the increased supply. The loss of passengers can only to some extent be explained by a rise in fares of about 19 per cent, which is seen to be due to decreased subsidies. Rather, the lack of co-ordination between the bus companies' time-tables is considered to be an important explanatory variable (see e.g. Tyson, 1990). Passengers also face obstacles like constantly changing time-tables, for example when companies enter or exit the market, and the problem that tickets for a route often are company-specific (see e.g. White, 1991, and Glaister, 1991). As a consequence of the declining number of passengers, the costs per passenger-journey have not decreased since deregulation, but remained unchanged. Following a strong trend towards increased seller concentration, there have also been concerns about the possibilities to keep competition workable in the long run.

In London however, the development has been quite the opposite. Reductions in costs (through tendering) have been achieved without considerable losses of passengers, despite the fact that subsidies have decreased and fares have increased by the same magnitude as in the rest of the country (see e.g. Nash, 1993, and Mackie, Preston & Nash, 1995). The common explanation has been that keeping the system integrated has made it possible to avoid some of the pitfalls of a complete deregulation.

In order to tackle the decline in patronage, some bus operators and local authorities went into voluntary agreements referred to as Quality Bus Partnerships during the 1990s. While the authorities would provide improved infrastructure, bus operators would invest in new vehicles etc. In the year 2000, the Labour government delivered a new Transport Act, which encouraged the use of such partnerships, with the possibility to have them legally binding. The Act also made it possible under certain conditions to use so-called Quality Contracts, essentially replacing deregulation with a form of competitive tendering procedure (Nash, 2008). While the latter alternative

has not been used, there has been a growth in the use of Quality Bus Partnerships.

Looking at the developments since 1996/97, there have been some changes in trends, as presented by e.g. Preston (2005) and Nash (2008). Costs per bus kilometre have risen in London while being mostly stable outside of London. Also, subsidies in London, which had been practically eliminated in 1997, have increased sharply. Some of this can probably be attributed to a strong increase also in the supply of services and a 47 per cent rise in patronage, but it can also be assumed that the growth of Quality Bus Partnerships outside London has played a role in slowing down the rate of decline in those areas. Moreover, there are some success stories of deregulation in cities such as Oxford, York and Brighton, where local authorities have taken action to provide better conditions for bus services, and operators have been willing to invest accordingly.

Railway privatisation

At its height in 1914, the British railway network encompassed 32,000 km of tracks, operated by 120 competing firms. In 1923, the British government combined these into four main groups. The outbreak of World War II implied that the railways were placed under government control. In 1947, by means of the Transport Act, the British railways were nationalised, and from 1948 became known as British Rail (BR). For several years, British Rail was controlled by a special transport commission, but in 1963 this was replaced by the British Rail Board. The Board focussed on the development of the major lines and the closure of low-density, unprofitable lines. Between 1963 and 1975 the network shrunk from 28,000 km to 17,000 km and the staff was almost halved.[8]

Nonetheless, during the 1970s BR came under attack from critics who pointed at low productivity, inefficient management and ever-increasing subsidies (see for example Pryke & Dodgson, 1975).

In the early 1980s BR experienced a severe financial crisis, which prompted the work of the so-called Serpell committee. In its report of 1982, it was argued that major closures were necessary to reduce the need for subsidies to BR (Serpell, 1982). This advice was not followed however, partly due to political concerns. Instead, BR was reorganised into several business sectors and was subsequently commercialised. Also, several of BR's activities not directly related to rail services, e.g. British Transport Hotels, were divested. These strategies seem to have been important factors behind the remarkable improvement in BR's productivity during the 1980s.

[8] These figures and facts stem from the article on British Railways in Encyclopaedia Britannica.

Nevertheless, from 1983 and onwards, several academics and right-wing thinkers argued for rail privatisation, although they differed in their views of how to proceed.

Advocates of rail privatisation gained useful arguments from the research on contestable markets, transaction cost economics (see previous chapter), and the deregulation of the US railways sector (described in more detail later in this chapter). Other important influences were the EC directives aiming at opening up the railways to competing operators and Sweden's vertical separation of infrastructure from operations and introduction of competitive tendering on regional lines. Administrators from the Department of Transport as well as representatives of British Rail visited Sweden (including visits to the new entrant BK Tåg) in 1991-92 in order to learn more about the Swedish experience.

When BR's financial situation once again deteriorated in the early 1990s, the search for an appropriate form of privatisation was intensified (Nash & Preston, 1993). Although the Conservative government was now determined to force through a privatisation, the existence of different options and the difficulty of choosing between them caused delays in the formulation of a privatisation plan. But in July 1992 a plan finally arrived, taking the form of a White Paper (Cmnd 2012 (1992)).

The White Paper was criticised for being rather short and lacking details specifying how and when its proposals were to be implemented. However, a number of consultation documents produced by the Department of Transport followed, along with a report from a parliamentary committee, which clarified the picture. The end result of this process was the 1993 Railways Act, which was passed in the House of Commons in November 1993, after much debate and heavy opposition from the Labour Party.

The intention of the reforms was to make "better use of the railways, [to ensure] greater responsiveness to the customer, [to achieve] a higher quality of service and better value for money for the public who travel by rail" (OPRAF, 1995, p. 29). This was to be achieved mainly through privatisation, based upon a belief in the superior incentives provided by the private sector (Foster, 1994). The 1993 Railways Act laid the ground rules for the privatisation of British Rail, setting out the regulatory and statutory conditions under which this process, beginning in April 1994, could be undertaken.

The company Railtrack was created by the Act, and its key purpose was to own, maintain and develop Britain's mainline rail infrastructure. Originally, the company was to be kept in public hands, but in 1996 it was completely privatised when the shares were floated on the stock market. The rolling stock was divided between three separate Rolling Stock Companies (ROSCOs), which were subsequently sold to the private sector in 1995-96.

BR's freight business was privatised and open access for freight operators was introduced. BR's passenger rail operations were reorganised into 25 separate units, then transformed into Train Operating Companies (TOC). One or two at a time, these companies were subsequently franchised by means of a tendering procedure, with interested parties placing bids based upon required subsidies. The tenders were organised by the newly created Office of Passenger Rail Franchising (OPRAF) and the process was completed in late March 1997. Although the response from the private sector to TOC franchising was lukewarm in the beginning, the bidding process in 1995-97 was very competitive, with 5-10 serious bids for each franchise. Including the limited number of management buy-outs, a total of 11 separate organisations entered the UK passenger train industry by means of winning franchises in tenders. Companies related to the bus industry (such as Stagecoach, National Express and First Bus) were very successful. National Express won more franchises (five) than anyone else, while French conglomerate Connex grabbed the biggest market share (16 per cent of ticket revenues) (Alexandersson, Ehrling & Hultén, 1997).

Including the sales of the supporting businesses, BR was divided into more than 80 separate companies, the intention being to create competition in as many parts of the sector as possible (Nash, 1997). A number of new regulations were also designed to encourage competition and guard passengers' interests concerning the prices and coordination of rail services. The overall responsibility for making sure that the different actors followed these rules was placed in the hands of the Office of the Rail Regulator (ORR).

The whole reform was completed in April 1997, not long before the parliamentary election in which the Conservative Party's 18-year reign was brought to an end. The winning Labour Party decided not to reverse rail privatisation (as it had promised), but to expand investments and strengthen the regulatory body. OPRAF was transformed into the new Strategic Rail Authority, established in 2001 (Holvad, Preston & Huang, 2003). The new authority set out to re-franchise the operations of the TOCs and introduce longer agreements (20 years instead of 7 years) in return for TOC involvement in infrastructure investment. Railtrack was perceived as lacking the ability to invest enough on its own, and the new idea was to finance major infrastructural improvements from a variety of sources (SRA grants and private capital), while Railtrack would buy the assets once they had been completed (Nash & Smith, 2006). However, for a number of reasons, these ambitious plans were not realised. The so-called Hatfield accident in the year 2000 set off a series of events that eventually led to the collapse of Railtrack, which was re-placed by a non-profit company, Network Rail. Also, several TOCs turned out to have problems fulfilling their obligations (see further

below). Therefore, several franchises were re-negotiated to temporary cost-plus contracts in order to later be re-franchised with the old contract length of 7 years. Infrastructural investment did increase, but the funds were directed in order to maintain and renew the existing network rather than to perform major upgrades.

Since privatisation started, there has been a substantial concentration in terms of the owners behind different franchisees; National Express is now the owner of 11 TOCs. When re-franchised, competition has generally continued to be strong. On one occasion a tender was stopped prematurely since too few (only two) operators were pre-qualified (Nash & Smith, 2006). It has generally been difficult for the incumbents to defend their franchise in tenders.

The TOCs were to be paid annual subsidies according to net cost agreements, typically to be reduced over the contract period. In some cases it was even envisaged that the TOCs would be able to make enough profits to be able to pay back money towards the end of the contract period. However, in several cases, these subsidy levels turned out not to be sufficient and in a couple of cases the winning bidders were clearly too optimistic. For this reason, some franchises had to be renegotiated or re-franchised early, for example leading to the complete exit of Connex in 2003 (Nash & Smith, 2006).

After some initial reductions in the subsidies to train operators, they are now considerably higher than originally projected – almost back to the level pre-privatisation – and are expected to rise further when track access charges are increased to account for the revised costs of Network Rail. Since the collapse of Railtrack, there has actually been nothing less than a cost explosion in the British rail industry, affecting not only infrastructure but also train operations and rolling stock investments (Nash & Smith, 2006). Another important driver of rising TOC costs has been the substantial increase in staff wages (Nash, 2008).

On the other hand, in terms of demand, the British experience is much more positive. It is clear that passenger demand and revenue have increased substantially since privatisation, although it is difficult to establish the relative importance of the possible multiple reasons (such as for example the impact of business cycles) behind this development.

Railway reforms in the U.S.

The railway network in the United States was constructed during a period of 100 years (beginning in 1825) by means of private capital investments without any direct support from the government. Federal economic regulation of the industry began with the Act to Regulate Commerce in 1887. This was

the result of a political reaction to the perceived and real abuses of monopoly power (such as price and quality discrimination) that had led to public hostility towards the railways. The Interstate Commerce Commission (ICC) was given responsibility for administering regulations, and several additional interventions followed, leading to highly regulated tariffs and services (Thompson, 2005, and Spychalski, 1999).

Measured in size, the US railway system peaked in the 1920s. From then on, it started to shrink as it faced increased competition from trucks, waterways and automobiles. After a temporary halt during World War II the downward trend accelerated in the 1950s as the construction of rapid highways took off, private car ownership increased and the airline industry grew in importance (Thompson, 2005). Proponents of road and water interests successfully hindered reforms aimed at improving the situation for the railways. Many railway companies came close to bankruptcy as increasing losses from the passenger services could no longer be covered by means of cross-subsidisation with the revenues from freight services. Eventually, the crisis following the bankruptcy of Penn Central Transportation in 1970 (which at the time constituted the largest corporate failure ever in US business history) became the catalyst for change (Spychalski, 1999). In order to avoid the closure of all rail passenger services in a region hosting 40 per cent of the nation's population, the Congress passed an act that created the government-subsidised National Railroad Passenger Corporation (known as Amtrak) as a way to nationalise the operations of intercity passenger services. In a similar development, the responsibility for most commuter services was transferred from railway companies to local and regional authorities. With this massive transition from private to public sector ownership, the regulations regarding passenger services were also virtually eliminated, providing a freedom on pricing and line closure not present since the Act of 1887 (Spychalski, 1999).

Economic regulation prevailed in the rail freight sector, but in the mid 1970s the crisis incurred by the simultaneous risk of six important railroads going bankrupt led to another act of federal intervention. The six railroads were merged into a new government-funded company, Conrail, in 1976. This was paired with the first effort to reduce economic regulation by means of the so-called 4R Act (Spychalski, 1999). Despite these efforts, more rail-freight companies approached bankruptcy at the same time as Conrail incurred massive losses, which eventually lead to the passage of the Staggers Act in 1980. This Act commonly became known as the deregulation of US railways, as it had the principal goal of allowing private railway operators more freedom regarding tariffs and service conditions. One of the most important aspects was the new possibility to market rail services on a contract basis, leading away from published tariffs to confidential agreements between

railway companies and their customers (Thomson, 2005, and Spychalski, 1999).

Railway industry development following the Staggers Act is widely believed to be mostly positive. Labour and investment productivity have seen dramatic improvements, enabling unexpected reductions in freight tariffs and a return to profitability for railroad companies (Uri & Rifkin, 1985, McFarland, 1987, Wilson, 1994, and Thompson, 2005). Conrail was eventually sold in 1987. The renewed focus on efficiency and reliance on market forces has also had an impact upon ICC policy regarding railroad company mergers.[9] The freight operators have been allowed to merge into ever larger units: In 1986 the seven largest railroads had a combined share of industry revenues amounting to 85 per cent (Alexandersson, Ehrling & Hultén, 1997). Further mergers have led to a situation where only four large companies remain, controlling more than 95 per cent of all rail freight volumes.

In comparison, the history of Amtrak is a rather different matter. Since its creation, it has cost the Federal Government more than US$ 30 billion in subsidies. In 2005, the company fell into a severe financial crisis, leading to a new reform program. The program appears to have had some effects, e.g. on the need for subsidies (Amtrak, 2007).

Some key differences between the US model of railway organisation and reforms, when compared to those of Europe, seem important to stress. Firstly, vertical separation of infrastructure from operations has not really been an issue. US railroads still own their tracks or pay charges for using tracks owned by other railway companies. The federal government has not stepped in to take responsibility for rail infrastructure, nor has it treated it as a crucial asset separate from railway operations. Secondly, apart from some urban areas with mass-transit operations, freight services completely dominate the US railway sector. Railway passenger services are also dwarfed by other means of passenger transportation. Although Amtrak has a significant share in the North Eastern Corridor markets, its national market share is only 0.1 per cent of all passenger kilometres and less than 1 per cent of all public transportation. State-operated mass transit and suburban rail passenger networks produce slightly more than Amtrak in terms of passenger kilometres (Thompson, 2005). Thirdly, competitive tendering of railway services has played a very minor role in the US. There are some noteworthy cases, for example the local train services in Boston, but these are really exceptions. According to some researchers, the concept of competition for minimum subsidy has been very difficult to establish in a debate dominated

[9] ICC was replaced in 1995 by the Surface Transportation Board (STB).

by the opposing poles of keeping the current system of public operations versus total privatisation (Thompson, 2003).

Some observations

Studying the development of transport reforms in Europe and the United States makes it clear that although both have been affected by something of a mega-trend of regulatory reforms aimed at introducing more competition and increasing the role of the private sector, there are important differences in terms of highlighted problems, the choice of and implementation of reforms, and related progress. In the EU, some countries have also chosen to take the lead, not waiting for reforms to happen on a more EU-wide level.

As the EU framework gradually evolves, more and more countries become involved in the process of reforming the industry – sometimes willingly and sometimes under pressure from Brussels. In a way, the development of the regulatory framework of the EU has allowed for different approaches and choices to be made by different countries along the way, which can partly explain how and why there are so many different stories of development.

Moreover, even after two decades, the regulatory reform process of the EU is constantly changing, as both central and peripheral forces come up with new proposals and interpretations that affect the ongoing process.

5. Contextual development II: Deregulations in other Swedish sectors

Having already considered in some detail the international movement of deregulation and privatisation, including the experience from related reforms in the transport sector, it is also important to recognise that the regulatory reforms in the Swedish bus and railway sectors are not unique when we look at them in the context of general trends of industry development in Sweden. However, they do represent very early cases in the direction of opening up the markets to more competition. The financial and monetary markets were deregulated in the late 1980s, although similar reforms in most other sectors did not happen until the early 1990s. For example, the domestic airline industry was deregulated in 1992, the telecommunications industry and postal services in 1993 and electric utilities in 1996 (Konkurrensverket, 1998). As such, the regulatory reforms in other sectors primarily form a context to the development in the bus and railway sectors when it comes to the continued reforms of the 1990s and 2000s. Nevertheless, it is worthwhile to take a closer look at this context, which is the purpose of the chapter at hand. We will look at four industries where (like bus and rail) elements of infrastructure play an important role for the function of the system. All these industries have also at some point been considered to have characteristics of natural monopolies.

Domestic aviation

Before the deregulation of the Swedish domestic airline industry, the market had for a long time been dominated by two companies, Scandinavian Airlines (SAS) and Linjeflyg. SAS operated the main lines between Stockholm and the cities of Gothenburg, Malmö, Luleå and Kiruna, while Linjeflyg operated lines not of interest to SAS. In addition, a few regional operators existed. Both SAS and Linjeflyg were *de facto* monopolists on their respective lines, although this was stipulated by praxis rather than actual regulations. Any new entrant would have had to seek the government's permission to operate a domestic airline service. Moreover, cabotage was strictly forbidden, i.e. only Swedish domestic companies were allowed to operate in Sweden and SAS also had the right of precedence on international services.

A price-regulation clause implied that the fares of SAS and Linjeflyg had to be approved by the Aviation Authority. The companies were obliged to

uphold their domestic traffic, but in case lines were unprofitable they could ask for state subsidies (Alexandersson *et al.*, 1999).

Within the European Union, a liberalisation of air transport had been initiated in 1979 and took place in several steps, with the third "package" implemented in 1993 (Konkurrensverket, 2004). At that time, Sweden was not yet a member of the European Union, but had initiated its own liberalisation at the end of the 1980s following a period of strong growth in the sector. In 1990, a special Competition Committee had suggested that 8-10 of the major lines (which ran more than 300,000 one-way trips every year) be opened up for competition as a first step towards a complete deregulation. However, citing capacity problems at Arlanda airport, the government and Parliament decided that as a first step competition would only be allowed between SAS and Linjeflyg. This decision came into force in January 1992. Within a month, SAS placed a bid to acquire a majority share of Linjeflyg, in effect nullifying the whole reform. The acquisition was allowed by the competition authorities since Linjeflyg was close to bankruptcy and no other Swedish buyer seemed to be interested, but the acquisition – and the sharp decline of domestic airline traffic in 1991 – paved the way for a true market-opening reform in mid 1992, which also got rid of regulated prices (Alexandersson *et al.*, 1999).

By 1997, several studies had been completed (Luftfartsverket, 1994, Konkurrensverket, 1996, and Nutek, 1997) that evaluated the effects of deregulation. They found that new operators were operating regular services in direct competition with SAS, increasing supply on these particular lines. An initial price war had been followed by a period of stabilisation and even higher fares, indicating that after a while companies focussed on competing more by means of supply than prices. No additional hub outside of Stockholm had been created, but Bromma airport had grown into a mini-hub of its own in the Stockholm region. While Linjeflyg and SAS had previously cross-subsidised regional traffic quite substantially, the supply in 1995 covered roughly the same lines but was run by profitable, separate companies.

Domestic airline service had lost some of its modal shares of transportation, but on the other hand international traffic had grown in importance. Two early and strong competitors to SAS, Transwede and Malmö Aviation, came to face problems and were bought by Braathens in 1996-97 and 1998, respectively.

Overall, by the end of the 1990s the deregulation of domestic aviation was considered to be a slight disappointment, in particular when compared to the high expectations. The Competition Authority determined that capacity constraints at Arlanda and Bromma, combined with the use of grandfathering in the distribution of slots, to be significant obstacles to the development of

more competition. The Authority also made a strong effort to show that the frequent flyer program used by SAS had a lock-in effect which hindered competition, and could even be considered the equivalent of abuse of dominant position. In 2001 a court ruling actually made it illegal for SAS to award its passengers frequent flyer points on domestic lines where the company faced competition (Marknadsdomstolen, 2001).

Then in 2001, the 9/11 attacks in New York and Washington D.C put the airline industry worldwide in a state of shock. In Europe, the turmoil that followed meant that low-cost airlines like RyanAir started to become much more prominent, causing big national airlines to rethink their strategies and leading to a series of mergers. In Sweden, several local airlines emerged with a low-cost profile, and started to gain momentum. Braathens was bought by SAS in 2002, while at the same time Malmö Aviation re-emerged as a separate company again.

During the 2000s domestic airline traffic has continued to decline, while international traffic has increased. Some unprofitable domestic lines are now procured by the authority Rikstrafiken according to a competitive tendering procedure. SAS, collectively half-owned by the Swedish, Danish and Norwegian governments, has had severe difficulties staying profitable and has reduced its number of departures, making room for other companies to enter and grow. By 2009 the company ran only about 40 per cent of domestic aviation passenger services in Sweden (down from 95 per cent in 1992 and 75 per cent in 2001), and was allowed to relaunch its frequent flyer program (Konkurrensverket, 2009, and SAS, 2009).

Telecommunications

In contrast to many other countries, Sweden has never had a legal monopoly on telecommunication services. However, actual competition was effectively terminated in 1918 when the telephone administration Televerket acquired the company Stockholm Telephone. For a very long time Televerket then held a *de facto* monopoly. This came to be considered a natural monopoly although it was not explicitly discussed in these terms until the mid 1980s when some of the problems of the monopoly became more and more apparent (Helgesson, 1999, p. 12ff). The only legal basis for the *de facto* monopoly was a number of limitations regarding the connection of devices from other equipment providers to the common telecommunications network (such as answering machines, fax machines and phones). These limitations were gradually dismantled during the 1980s (Konkurrensverket, 1998).

As early as 1971, Televerket itself took the initiative to liberalise the market for mobile telephones, allowing the equipment of external mobile telephone suppliers which could also market their products directly to end-

users, provided that they had been approved by Televerket (Hultén & Mölleryd, 2003, p. 327). During the late 1970s and early 1980s, the continued development in mobile telephony meant that Televerket for the first time since the early 1900s came to face actual competition from other operators in Sweden. In 1980, the company Kinnevik (controlled by entrepreneur Jan Stenbeck) entered the market for mobile telephony by means of an acquisition, and then formed Comvik. In 1981 Comvik gained a licence to run an automatic mobile telephony network of its own. Consequently, when GSM licenses were handed out at the end of the 1980s, Comvik (now Comviq) was already an established operator. As expected, Comviq, as well as Televerket, received their GSM licenses, but in the end a third actor, Europolitan, also got a licence of its own (granted by the government in 1990), something which had not been foreseen (Andersson & Mölleryd, 1994).

In 1993 Sweden acquired a new Competition Law and at the same time, a new Telecommunications Act (Konkurrensverket, 1998, 2004). Simultaneously, Televerket was transformed into a state-owned company, Telia AB. The Telecommunications Act meant that the Swedish market changed from an unregulated monopoly market to a market characterised by regulated competition. A new authority, Telestyrelsen, later Post- och Telestyrelsen (PTS), established in 1992, also took over remaining regulatory tasks from Televerket.

International companies such as American AT&T, British Telecom and France Telecom entered the Swedish market for international calls in the early 1990s and Swedish Tele2 started offering foreign calls in 1992. These new telecom providers early on took substantial market shares from Televerket (Helgesson & Ioannidis, 1994).

By 1993 it became possible for private households to make telephone calls (from fixed connections) charged by other operators than Telia (although carried by Telia's access network) by means of dialling a prefix before the actual number. In 1999 it became possible to avoid the use of a prefix by instead registering a choice of operator. This reform caused an influx of new operators.

In 2000 Telia was partly privatised and its shares were floated on the stock market. That same year a beauty contest for 3G mobile telephony was awarded to four operators, but not to Telia (probably since Telia had avoided to promise as much as the others). Eventually, Telia entered into a joint-venture with rivallingTele2, although all operators eventually failed to deliver on their ambitious plans for the establishment of individual 3G networks. In many other countries 3G licenses were instead awarded through real auctions, causing some companies to bid aggressively for the contracts.

By the end of the 1990s, European Union reforms within the telecommunication sector had started to catch up with the pace of Swedish reforms (Hultkrantz, 2005). In 2003 a new law on Electronic Communication replaced the Telecommunication Act. This new law is based upon a number of EU directives that strive to encourage the development of the EU market for electronic communication in a way that would make general competition rules efficient enough for this market (Konkurrensverket, 2004).

In 2005 it finally became possible for private households to leave Telia entirely, as other operators were allowed to sell the access to fixed telephony services (PTS, 2010). In 2007 the access network was divested to a separate (Telia-owned) company in order to make the conditions for competitors more neutral in relation to Telia.

In general, the liberalisation of telecommunication services (both for fixed and mobile telephony) is now considered a success, but along the way a number of controversies and obstacles have had to be addressed by both the Competition Authority and PTS. Much debate and controversy during the whole period of the market-opening process has been linked to tariffs to be paid by Telia's competitors when a call is originated and terminated over Telia's network. These controversies have highlighted the need for, and affected the direction of, further reforms.

Postal services

In 1993 the monopoly held by Postverket on regular distribution of letters in Sweden was abolished. In 1994 a separate regulation by means of a Postal Act was introduced. Simultaneously, Postverket was corporatized into Posten AB.

In the early years following the market opening only a few postal operators entered the market, but during 1997 this figure increased, leading to a total of 100 licensees. From then on the numbers have been in decline (Konkurrensverket, 2004). In 2004 they were 35. Apart from Posten AB no other company can offer a national distribution net. CityMail is the largest of the "private" operators, owned by Norwegian Post since 2002. The company was founded in 1991 and has been the major competitor to Posten regarding company-to-company or company-to-private-household postal services. Over the years it has gone bankrupt twice (SOU, 2005:4).

According to Andersson (2004) it is not possible to make a unified statement on the development of prices since market opening. The price for single letters has increased but part of this is due to VAT changes. It is even more difficult to judge the development of other postal services like packages, due to the diverse weights and changes in the pricing principles.

However, it seems as if the pricing structures of various services have become much more adapted to the actual related costs.

With the Internet boom of the late 1990s and 2000s there has been an increase in purchases made from home, making the distribution of small and medium-sized packages to private customers a flourishing business. This has created a basis for several competing delivery firms (including large international forwarding agents) contracted by various Internet retailers.

A number of post offices have been closed due to the restructuring efforts of Posten, but in general these have been replaced by postal services at shops and gas stations, often with better opening hours than traditional post offices (Konkurrensverket, 2004).

PTS is the authority in charge of monitoring the postal market, but in contrast to its role in telecommunication it has no obligation to foster competition. The Competition Authority has on several occasions reacted to the methods used by Posten to shut out competitors, most prominently CityMail, from necessary infrastructure like postal boxes and the handling of postal numbers (Mattsson, 2004, Konkurrensverket, 2004). There have also been a number of instances where Posten has tried to compete by the use of new pricing zones and various customer loyalty schemes (linked to discounts). In several cases these practices have been found to be abuse of dominant position (Konkurrensverket, 1998).

Newly established firms have typically had a hard time in gaining ground and many have disappeared from the market. Overall, Posten is still a very dominant player. In 2008 it was announced that Posten would merge with Post Denmark.

Since 1992 there has been an ongoing movement in the EU to create a common European postal market. By means of the third Postal Directive, 2008/06/EC, it is now foreseen that market opening will take place by the end of 2010 in 16 countries, representing 95 per cent of the total postal market in the EU (European Commission, 2009).

Electric utilities

In 1996 a new regulatory framework was introduced to the Swedish market for electricity. This reform introduced competition into the production and selling of electricity, while the facilities needed for the actual physical distribution (transmission) were kept monopolised, as this part of the market was considered a natural monopoly. This is generally referred to as the network business and includes maintenance of the electrical grid. The Electricity Act stipulated that production and selling of electricity were to be separated (at least in the judicial sense) from the network business, although

they were still allowed to be carried out within the same overall corporate structure.

As early as 1992, the major high-voltage grid for electricity distribution over long distances was affected by a reform that meant that a separate business administration, Svenska Kraftnät, took over the responsibility for this part of the network from Statens vattenfallsverk, which was corporatized into Vattenfall AB. This was an important prerequisite to later reforms (Konkurrensverket, 2004).

The idea behind the reform in 1996 was to make it possible for consumers to choose between different providers of electricity, in the belief that competition would push down costs and ultimately also prices. Initially, an electricity meter was required to actually be able to make a choice of electricity provider. In 1999 this obligation was abolished, which widened the scope of market opening to all consumers of electricity (Konkurrensverket, 2004).

Since the early 1990s there has been a major concentration of the production facilities (or the ownership of these) in Sweden. After the 1996 reform this process has accelerated. Three companies now produce about 90 per cent of all electricity in Sweden, with state-owned Vattenfall being the major player. These companies have also become internationalised, and NordPool has been established as a common spot market for electricity in the Nordic countries, where prices are set according to marginal cost principles.

One problem with the open Swedish electricity market has been that many customers, at least initially, were not very active in seeking better prices from alternative suppliers of electricity. This has hampered price competition. Moreover, all customers are still bound to use their respective network company, paying a special network fee. In addition, a number of fixed and variable taxes (and VAT on these taxes) affect the ultimate price paid by consumers and these taxes have generally increased greatly since the reform of 1996. All in all, only about 30-40 per cent of the total price for electricity can be affected by the choice of supplier. Between 1990 and 2003 total electricity prices rose by 65 per cent in fixed prices (Konkurrensverket, 2004).

Energimyndigheten (the Energy Authority) was formed in 1998 to monitor prices and market development. Network tariffs have to be reasonable. Therefore there is an element of price regulation on this part of the market, but the monitoring is done *ex post*, which is different from many other countries (Konkurrensverket, 2004). Since 2002, tariffs are checked against a certain formula, which involves calculating the so-called network benefit as a basis for establishing whether prices are too high.

The Competition Authority has reported that the lack of enough vertical separation of the network business from production and selling may lead to cross-subsidisation and market disturbances (Konkurrensverket, 2004).

A general conclusion from deregulation is that the market has become more efficient and has a more efficient pricing mechanism, although the changes in taxation have meant that many customers find the state of affairs after deregulation to be negative in terms of the prices they pay (Bergman, 2002, and Bergman & Amundsen, 2004).

Finally, within the European Union there is currently an effort underway to create an internal market for gas and electricity. A directive with this purpose, Directive 2003/54/EC, was implemented in 2004, but according to a recent report from the European Commission (2010) the market is still too fragmented and more cross-border distribution needs to become established.

Overview and some concluding remarks

At first glance, the material presented above may seem too fragmented to make it possible to draw any overall conclusions. It is also certainly the case that sector-specific conditions do play a major role in what kind of reform is possible and what consequences it will eventually lead to. However, there are a number of observations that can be pointed out. First of all, there has been a clear movement in Sweden (and a rather politically-oriented one) to open up these markets to new entry and competition, generally built upon the idea that this would foster efficiency and lead to lower prices. Some of the reforms were initiated by the right-centre-liberal government in office between 1991 and 1994. Domestic aviation and telecommunications seem to be exceptions, as the reform process started earlier in these sectors. As was described above, Televerket itself early on asked for a deregulation of the mobile telephone market (Hultén & Mölleryd, 2003). With the possible exception of aviation, Sweden was also initially well ahead of its time with all these reforms compared to developments within the EU. At later stages (after becoming an EU member state) Sweden has, for example regarding reforms in the telecommunications sector, become more keen at adjusting the pace and direction of reforms to the EU standard (an observation also made by Hultkrantz, 2005).

What about the "natural monopoly" character of certain industries? A general observation is that the notion of a current state of organisation being due to "natural monopoly" characteristics has been challenged in most sectors. In some cases, like in the telecommunication sector, technological development made it possible to introduce competition where it had not been possible before (with several operators sharing each others' networks and handling exchange by means of a clearing price mechanism). In most other

cases it has been necessary to redefine what part of the industry really is to be considered a natural monopoly, allowing for vertical separation of formerly integrated structures and introducing competition in operations such as train services and sales of electricity. To some extent, the arguments for doing this had to be supported by a clear declaration that the merits of competition might outweigh possible disadvantages in terms of lost economies of scale or increased transaction costs.

The Competition Authority has been an important player in the development of all these newly liberalised markets, monitoring potentially damaging practices by the former monopolist, and sometimes explicitly asking for additional legal reforms in order to handle certain issues. Several monopoly markets that have been broken up by regulatory reforms have, at least initially, resulted in a situation where the incumbent, former monopolist, primarily faces competition from substantially smaller firms. Several of the issues to pop up, sometimes before but usually after the initial steps towards deregulation, have therefore been related to the relationship between the former monopolist and its new competitors. Access to critical resources (and the prices of these resources), sometimes still in the hands of the incumbent, has been a recurrent theme, for example in postal services (post boxes), railways (rolling stock and booking systems) and telecommunications (the access net). In order to nurture competition, it has sometimes been necessary to make good use of the Swedish competition law (and European competition law), with their specific rules on what a so-called dominant market player may or may not do. In effect, this has made several of the post-monopoly markets special in the sense that they have been more likely to be directly affected by asymmetric conditions for the various market actors, and also a related need to define what the relevant market is.

In 2003, the government took the initiative to form a committee (Regelutredningen – the Regulatory Reform Commission) that would look at previous evaluations of the reforms that had taken place in a number of industries (including the ones discussed above) in Sweden since the early 1990s. The aim was to make an overview and discuss the long-term effects for consumers, the business environment, the labour market and the socio-economic factors. Building on the resulting report (SOU 2005:4) and additional observations, one may produce a comparative overview such as presented in Table 2a. While market (seller) concentration has decreased and productivity has increased in all sectors, it is also evident that prices have typically increased after deregulation (with the exception of telecom). For the rest of the parameters, the results are somewhat of a mixed bag.

Table 2a. Development after liberalisation in some Swedish sectors

Sector	Aviation	Telecom (fixed)	Telecom (mobile)	Postal services	Electricity
Pre-reform structure	Regulated oligopoly	De-facto monopoly	Regulated competition	State monopoly	Local monopolies
Post-reform structure	Deregulation, competition	Competition	Competition	Limited competition	Competition (partly)
Sweden vs. EU	Early/ syncronised	Early/ syncronised	Early	Early	Early
Public ownership of operator/s	Lower	Much lower	Much lower	Lower	High/higher (?)
Prices compared to index	Increased	Decreased	Decreased	Increased	Increased
Production	Decreased	Increased	Increased	Decreased	Unchanged
Employment	Decreased	Decreased	Increased	Decreased	Decreased
Productivity	Increased	Increased	Increased	Increased	?
Market concentration	Decreased	Decreased	Decreased	Decreased	Decreased?

One important limitation with a compilation such as Table 2a is that it does not capture the step-by-step evolution of the reform process, and the instances where – as was the case for aviation – an initial stage of falling prices has been followed by a period of rising prices. Moreover, as markets continue to evolve, many statements may become outdated.

In the concluding final chapter I will return to this table in an expanded version, including bus and rail, and elaborate in particular upon the possible reasons behind the observed differences between rail and bus, and some of the other sectors.

6. The development of Swedish rail and bus industries – historical background and the process of reforms

The origins of public transport

The great expansion of the transportation sector, initially for freight and later for passenger services, and the development of new modes of transportation, is closely linked to the process of industrialisation and urbanisation. Early on, motorisation was of great importance for the growth of ship transportation, both for long distance and short distance services. However, it was the railways that meant the breakthrough for interregional trade and domestic passenger services (Jansson, 1996, p. 22). Following a long pre-history in primarily the U.K., the construction of railways and railway networks really took off in the 1820s in Europe as well as in the U.S. and some other countries (see e.g. Cornwell (ed.), 1976, pp. 10-12, 32-36). The first subway line for public transportation opened in London in 1863, but it wasn't until the late 1890s (with the implementation of electric power) that the construction of subway networks was initiated in large cities.

Passenger services run by motorised buses were introduced towards the end of the 19th century, replacing coaches run by horses. Passenger services by train and bus were affected by the introduction of affordable motor cars in the early 1900s, with France and the U.S. taking the lead. In other parts of Europe, it wasn't until after World War II that car ownership started to spread rapidly. The improvement of the road network may also have been an important factor behind this development (see e.g. Jansson, 1996, pp. 22-28 and pp. 101-102). Ever since the rapid growth of car ownership, both railway and bus operators have had to face declining patronage and profits on several routes, typically leading to line closures, mergers and in some cases nationalisation. For freight-train services, the development of heavy trucks parallels the impact of the car on passenger services. Later on, the emerging airline industry became another important competitor for long distance journeys.

This condensed description refers primarily to the development in Europe and the U.S., but similar lines of development can be traced in many other countries, in some cases only later. International development and

experiences, especially related to regulatory changes in the bus and railway sectors, has already been dealt with in a previous chapter. We now turn to a more thorough description of the history of the Swedish rail and bus industries and the related processes of regulatory reform.[10]

The development of the Swedish railway industry 1853-2009

From commercial to nationalised and subsidised operations

The Swedish railway industry stems from the late 1840s, when the first private railway line for common traffic services was built (SJ, 1981, p. 15). In 1853-54 the Swedish Parliament decided that the state should build and operate a network of inter-regional railways, connecting all parts of the country. The Board for State Railways Operations was established in 1863. This unit later merged with the construction organisation, which was reorganised into SJ, the Swedish State Railways, in 1888. In retrospect, it seems that state control was motivated by the perceived risks for private sector control of inter-regional transportation (Nilsson, 1995, p. 171). During the first 20 years, construction primarily took place in the relatively densely populated southern part of the country. In 1872, Stockholm Central station came into use, becoming the heart of the network. Towards the end of the 19th century, railway construction spread to the northern parts of the country. By 1937, when the inter-regional network was completed, it also included very sparsely populated areas – motivated by social and political concerns.

From the beginning, private companies had also invested heavily in railway construction and operations. Towards the end of the 19th century this development continued, resulting in many regional and local lines feeding the state-owned inter-regional network. In the beginning of the 1900s, 65 percent of the railway lines were privately owned. However, when the competing road trucking industry started to grow rapidly in the 1920s, these private local and regional lines were particularly affected. Railway profitability dropped, and in 1935 the parliament decided to nationalise the private railways. One reason was the fact that the state otherwise was at risk of losing money connected to guaranteed state-loans to private railway owners (Nilsson, 1995, p. 172). The process of nationalisation was completed in the early 1950s.

[10] In order to give a comprehensive overview of the whole process of reforms in the rail and bus sectors, it partially includes information also presented in more detail in some of the articles reprinted in this thesis.

After World War II, SJ faced growing financial problems on low-density lines, especially on the former private railways. Initially it was possible to finance continued services by cross-subsidisation from profitable lines, but it became increasingly difficult for SJ to generate enough surpluses in the network. Since line closures were politically difficult to implement, these problems eventually led to the introduction of state subsidies for non-profitable lines in 1958. Furthermore, in the proposition forming the basis for the Transport Policy Act of 1963, SJ's network was separated into a commercial part and a subsidised part (Nilsson, 1995, p. 172, and Brunsson, Forssell & Winberg, 1990, pp. 56-57).

During the same period, a related yet separate development took place in the Stockholm region. In this region SJ had for a very long time run local passenger train services parallel to long-distance passenger services and freight services. The local train services had expanded up to the mid 1940s, but in the 1950s SJ was for various reasons experiencing increasing problems of low profitability on these lines. A discontinuation of these services was even considered, which would have transferred passengers to SJ's more profitable bus services. From a regional perspective, the continuation and expansion of these services was believed to be vital for the supply of good transportation for the growing population of the city and its suburbs. Therefore, this was one important ingredient in the 1963 negotiations between the region's municipalities, aiming at co-ordinating all public transportation resources in the region. In late 1964 an agreement was reached, followed by a contract in 1966, implying that SJ for the very first time became a contracted operator of railway services to a regional authority (Alexandersson, 2003).

The Transport Policy Acts of 1979 and 1988

Despite the establishment of subsidies in the Act of 1963, many unprofitable railway lines were closed during the 1960s, which was not popular among the general public or local interest groups. Eventually, in the early 1970s, the government instituted a temporary halt to line closures (Nilsson, 1995, p. 172). Continued deteriorating finances during the 1970s, due to increasing operating costs, decreasing revenue from primarily the freight services, and political barriers to responding by means of line closures and price increases, led to a situation where fundamental changes seemed necessary to handle SJ's problems. The Transport Policy Act of 1979 was to some extent a response to this development.

The Act of 1979 aimed at adjusting the cost burden between competing modes of transportation so that infrastructure costs reflected marginal social costs. This was believed to stimulate the usage of railways, which typically

have low marginal costs. One of the most important ingredients of the Act was the creation of a new institutional structure for local and regional public transportation – the so-called County Public Transport Authorities (CPTAs) (see below). Although primarily of interest for the bus services, several CPTAs also became directly involved in the decisions concerning local and regional railway lines threatened by closure. If they agreed to close these lines, and replace them with bus services, they would be given a state subsidy for a period of five years. The model meant a first general step towards decentralisation of responsibility for unprofitable railway lines, including the financing of these lines. While several lines were closed, some remained, now controlled by the CPTAs and using SJ as a contracted operator.

In 1980, subsidised railway lines constituted 50 per cent of the total network but carried only 10 per cent of the transported volumes. The state grants for these operations made up 13 per cent of SJ's total revenue (Nilsson, 1995, p. 172). Despite these subsidies, several extraordinary state grants, and the reforms linked to the Act of 1979, SJ's financial problems continued into the 1980s. A resulting Railway Law of 1985 aimed at reducing SJ's deficits: The state took an increased responsibility for infrastructure investments, while in return, SJ was to separate its accounts for infrastructure investments from other businesses and begin to pay track usage charges.

Despite these actions, SJ continued to present substantial deficits. A mere year later, in 1986, the firm estimated a need for 1 billion SEK in additional state grants to continue operations (Nilsson, 1996, p. 181). This led the government to initiate work that would result in the Transport Policy Act of 1988. Its major feature was the vertical separation of infrastructure from operations. The state took full responsibility for infrastructure investments and maintenance by means of a new authority – Banverket, while SJ was transformed into a train operating company, paying charges for using the tracks (based upon marginal costs for maintenance). The act also meant that the CPTAs gained an increased responsibility for local and regional railway services in 1990, compensated by a 10-year period of state subsidies equalling SJ's operating deficits on these lines. The rolling stock was also transferred to the CPTAs.

The introduction and diffusion of competitive tendering

A deregulation of the railways in terms of increased competition was not explicitly mentioned in the Transport Policy Act. Nevertheless, the vertical separation of infrastructure from operations, combined with the decentralised responsibility for local and regional railway services to regional authorities (along with the necessary money and rolling stock), made public procurement by competitive tendering of these lines possible.

Some CPTAs had already tried tendering procedures for their bus services, as a result of previous reforms in that sector (see the later section on developments within the bus industry). In contrast to the bus sector, no other operator apart from SJ existed when it became possible for the CPTAs to also tender railway services. Although several CPTAs initially chose to reach an agreement with SJ by means of negotiations without tendering, a couple of them did perform actual tenders as early as 1989. One of these tenders concerned the regional services of a network of lines in the south of Sweden, the foremost of which ran through the county of Jönköping. In this county, a minor family-owned bus company called BK Buss had been active since the 1920s. Following the establishment of the CPTAs in the early 1980s, it had been working as one of the CPTA's contractors for bus services. At a meeting with the CPTA in 1989, one official suggested that BK Buss should place a bid in the upcoming tender for the regional train services (Alexandersson, 2002). The idea materialized into an actual bid from a firm which came to be called BK Tåg, resulting in the firm's sensational victory over SJ and one other bidder. In May 1990, BK Tåg entered the Swedish railway market, breaking SJ's monopoly and becoming the first new private train operator for 40 years.

In early 1991, the Ministry of Transport expressed the view that more operators would stimulate the railway industry to make use of its resources in a more efficient way. At the time, there was a perceived fear among many politicians that SJ's dominance within the transportation market could become too strong, especially since SJ's management had been unwilling to concentrate on its railway services, instead keeping SJ a much diversified transportation conglomerate. After a shift in power in Parliament in September the same year, a new centre-right-liberal government declared its intentions of opening the railways to more competition. The first step was to subject more railway traffic to tendering.

When SJ was relieved of its responsibility for track infrastructure, it had been directed to only run profitable train services under its own account. While large parts of the unprofitable services were run on the regional lines and therefore under the responsibility of the CPTAs, many services within the inter-regional main-line network were also unprofitable. Since 1988, the state had been procuring these services by means of annual negotiations with SJ, instead of simply transferring subsidies to SJ every year to cover the deficits. In 1992, building on the experiences of regionally tendered services, a regulatory change made it possible for the state's negotiator to use competitive tendering for subsidised inter-regional services from 1993. The negotiation function was therefore transformed into a special procuring agency of the state. While the local tenders were for gross-cost contracts, i.e. the operator got no revenues from ticket sales, the tenders of inter-regional

services presupposed net-cost contracts. In this system, the bidding firm therefore has to project both the costs and the revenues from fares during the contract period and generally has more freedom to influence the services than under a gross-cost contract. Moreover, in order to gain access to several common functions and to necessary rolling stock, the new operators bidding for these contracts had to reach an agreement with the former monopolist, SJ. It took until 1999 before other firms than SJ were able to win a contract. The first case was the joint-venture Sydvästen, placing a spectacular zero-subsidy bid in the one-off tender for the West Coast Line, thereby also pushing the boundaries of the framework for competitive tendering (Alexandersson *et al.*, 2000, pp. 39-41). By that time, several of the railways' common functions had been removed from SJ and a proper price-list of vehicles had been established by the procuring authority and the government.

In 1993-94 several reports looking into the feasibility of deregulating the whole network followed, coupled with a fierce political debate. In May 1994, a bill on a far-reaching deregulation was passed in Parliament, despite strong opposition from the Social Democrats, the left-wing party and the railway unions. Unsurprisingly, when the Social Democrats regained power in Parliament through the election in September the same year, the deregulation of the railways was quickly postponed (Alexandersson *et al.*, 2000, pp. 25-29). Another important action taken by the right-wing government in 1994 was the tender of the new Arlanda Airport Link as a Build-Operate-Transfer contract, i.e. a type of Public-Private Partnership. The new Social Democratic government was unhappy with the distribution of costs for the project between the state and the private consortium, but ended up doing some relatively minor modifications to the original contract (Alexandersson & Hultén, 1998).

Less than two years after the complete deregulation of the Swedish railway market had been stopped, a less radical reform came into effect in July 1996. The functions of allocation of track capacity and train traffic control were transferred from SJ to Banverket, while other common facilities were made available to other train operators under commercial but non-discriminating terms. The CPTAs' rights were extended, making it easier for them to replace reductions in SJ's supply of inter-regional trains with regional CPTA-managed services, and further increasing the practice of competitive tendering. During these years investments in the infrastructure also increased significantly. During the recession years 1993-94, a political decision was made on increasing public spending on infrastructure investments to about 3 billion SEK per year. The real investment figures became substantially higher and reached nearly 10 billion SEK in 1995 (Alexandersson & Hultén, 2005).

Freight deregulation and the corporatization of SJ

One important additional element of the reforms of 1996 was the decision to open up the market for rail freight transport to competition. This was seen as a way to get rail freight more customer-oriented and also increase its modal share. Although a grandfathering clause was included to protect the competiveness of freight services that might rely on scale economies (Alexandersson *et al.*, 2000, p. 32), some new operators were able to win important rail freight contracts in direct competition with SJ.

A new Transport Policy Bill was passed in 1998. In an effort to achieve more equal terms for competing modes of transportation, in particular concerning freight, the track access fees were lowered. In order to make entry easier for freight operators competing with SJ, some fringe railway lines that had remained in SJ's hands were transferred to Banverket. Moreover, a new national authority, Rikstrafiken, was established. This authority took over the tasks formerly performed by the state's procuring agency, becoming responsible for competitive tendering of unprofitable inter-regional services (including all modes of public transportation), and aiming at better co-ordination with the CPTA-tendered services.

The CPTAs further increased their role in the railway market by buying new rolling stock or taking over the ownership of formerly state-owned rolling stock. For instance, in 1999 a group of CPTAs became owners of Transitio, a rolling stock company created by the train vehicle manufacturer Adtranz (later Bombardier) in Sweden.

Following the influx of new operators in 2000, a new Government Bill had the objectives of facilitating for SJ to adapt to the new competitive environment, and ensuring equal access to functions and services for all operators.[11] SJ's organisational structure as a business administration was therefore replaced in 2001 by several state-owned companies concentrating on specified railway businesses: The passenger division formed one company (SJ Ltd), the freight division another (Green Cargo), real estate became Jernhusen, vehicle maintenance turned into EuroMaint and Swemaint, etc. Two divisions, TraffiCare (cleaning services) and Unigrid (computer information systems), were fully privatised a few months later. The leasing contracts for rolling stock were kept in Affärsverket SJ (ASJ), the remains of the business administration SJ. Gradually, SJ Ltd has paid off their leasing debts and taken full ownership of the majority of the rolling stock. An important part of the rolling stock controlled by ASJ is leased out to operators winning Rikstrafiken's tenders, and consequently, ASJ in several respects

[11] Appendix 2 presents a series of maps showing the evolution of new market entry of rail passenger operators between 1988 and 2007, as well as the transformation of SJ from a provider of its own services to a contracted operator on most lines.

functions as a rolling stock company. In 2007 EuroMaint and SweMaint were sold to private investors. Jernhusen is still a state-owned company, which owns 150 railway stations and is the primary owner of buildings used for maintenance of rolling stock.

Post 2000 development: towards competition "on the tracks"

After the bill of 2000, the process of regulatory change in the Swedish railway sector slowed down during the next eight years. The Social Democratic government was unwilling to allow competitors to enter SJ Ltd's profitable lines. Nonetheless, in order to avoid bankruptcy, in 2003 the state had to intervene by transferring a substantial amount of money (1.8 billion SEK) to SJ Ltd from other state-owned companies, and increasing its borrowing rights at Riksgälden (the National Debt Office), from 1 to 2 billion SEK (Alexandersson & Hultén, 2005). It had then become clear that the breaking-up of SJ into several separate companies had been an under-financed reform, but also that several of SJ's contracts for regional and inter-regional passenger services were highly unprofitable due to the fact that SJ had won the tendered contracts with too low bids (Proposition (2002/03:86)).

The reforms in the following years focussed on modernizing laws and regulations to achieve a regulatory framework in line with European Union directives. Following the European Commission's first railway package, a new Railway Act (SFS (2004:519)) and a new Railway Regulation (SFS (2004:526)) followed, regulating the access to the state's railway infrastructure and the right to run railway services. A new regulatory body, the Swedish Rail Agency, was also established. Any operator wishing to operate train services on the Swedish rail network had to apply for a license from the Rail Agency. In 2009 this authority was incorporated into Sweden's new Transport Agency.

In 2007 SJ Ltd lost its monopoly on night trains and on charter trains. These changes constituted a first step towards a new order of competition "on the track", based on market principles without subsidies. That same year the government set up work in a new committee, to look into the possibilities of further market-opening of long-distance passenger services. By means of the committee proposal from 2008 (SOU 2008:92), and a related Government Bill in the spring of 2009 (Proposition 2008/09:176), the remaining SJ monopoly on long-distance passenger services is now set to be abolished step-by-step, starting with journeys offered during weekends (Friday-Sunday) in July 2009 (whenever capacity is available) and ultimately a completely open market by October 2010, although the long process of timetable

planning will mean that in practice this will probably not be accomplished before the end of 2012.

The Government Bill (adopted by Parliament in June 2009) may be seen as an adaptation of all domestic rail passenger services to the commitment of Sweden to open up the market for international passenger services in 2010 in accordance with EU's market-opening directive (2007/58/EC), which stemmed from the third railway package. The ultimate goal of the government's proposals for the passenger railway market is to create a general system of competition on the track, where operators may be free to enter and exit the market much like any other competitive market. Consequently, all operators willing to run trains commercially on the Swedish railway network will have the opportunity to do so – as long as capacity is not a constraint. However, an appropriate system for the distribution of track capacity is yet to be designed, and a number of other outstanding issues also remain to be solved.

In April 2010, the reform process took a new and unexpected turn as a direct consequence of the eruption of the Eyjafjallajökull volcano and its related spreading of ash into the atmosphere. As many airlines had to cancel both their domestic and international flights for safety reasons, the government decided to temporarily open up the domestic railway market for new entry and expanded services also on regular weekdays.

The development of the Swedish bus industry 1899-2008

From profitable private operations to subsidised monopolies

Although the first motorised bus service in Sweden was introduced in Stockholm in 1899, it was not until after 1910 that regular bus services started in other towns (SJ, 1986, p. 26). These bus services were operated by privately owned firms, with exclusive licenses on their routes. Direct competition between firms was rare, if it existed at all. Timetables and fares were not co-ordinated; the companies planned the services themselves and set their own ticket fares. For several decades, these bus services were run with a profit based upon ticket revenues alone, without subsidies (Alexandersson & Alexandersson, 1995, p. 1).

In 1911, SJ started its first bus line, and from the 1920s this line of business started to grow in a major way. Several new roads were constructed by SJ, and upon their completion SJ started to run regular bus services, without the need for a license. SJ's responsibility for postal freight services

also helped their bus services grow. Moreover, SJ started to operate bus services between cities without railway connections, and to replace many of the nationalised private railways with bus routes. In 1935, the parliament gave SJ a special grant for the acquisition of bus lines. This was the start of a series of acquisitions of private bus companies operating services that either competed directly with SJ's railway services or constituted important connecting services to the existing railway lines. In the early 1950s, SJ also started to operate its first long-distance bus lines from Stockholm to Gothenburg and other cities (SJ, 1986).

The expansion of private car ownership and the increased costs of operating bus services led the bus sector into a crisis towards the early 1960s. This prompted the development of a system of subsidies in order to maintain a minimum level of supply, primarily in rural areas (Hellgren, 2005, pp. 77, 86-90). At the same time, the first steps towards co-ordination and control of bus services by means of public authorities were taken in the Stockholm region and its surrounding counties. In 1969, the bus services of SJ and several private bus operators were expropriated by the newly founded authority Storstockholms Lokaltrafik (SL) (SJ, 1986, and Alexandersson, 2003). Similar events took place in many local towns and cities during the 1960s and 1970s. Thus, a large number of bus operators became municipality-owned during this period.

The Transport Policy Act of 1979 and the "bus deregulation" of 1989

The positive experiences from public co-ordination of local and regional bus services led to a proposition that this model should be used in all of Sweden's counties. By means of the Transport Policy Act of 1979, the parliament decided that a County Public Transport Authority (CPTA) was to be established in each and every county, and given responsibility for the co-ordinated planning and provision of bus services and the setting of ticket fares. This meant that such entities, often in the form of publicly owned limited enterprises (owned jointly by the county council and the municipalities of each county), became established in the early 1980s. One of the most important outcomes for passengers, apart from the co-ordination of services, was the introduction of subsidised monthly county travel passes.

The role of the CPTAs was to co-ordinate the routes of different bus operators, but the old system of route licenses was not affected. In several counties, this soon came to be viewed as an important obstacle to efficient co-ordination. Moreover, while ticket revenues now went to the CPTAs, the bus operators had to be compensated for their gross costs. Since costs generally were higher than revenues, the CPTAs had to use taxpayers' money

to cover the deficits. Increasing costs implied increasing deficits, and by the mid 1980s the share of the costs being subsidised by taxpayers' money had increased to 50-60 per cent, compared to 20 per cent in the early 1970s (Alexandersson & Alexandersson, 1995). Several CPTAs found it difficult to manage the tough negotiations with the contracted bus operators. All in all, this led to a new Parliamentary decision in 1985, which stated that all local and regional bus operators would lose their exclusive licenses as of July 1, 1989. Instead, the CPTAs would control all licences and thereby be better suited to co-ordinate the services.

The decision of 1985 provided the CPTAs with three different options for the future: 1) continue as before with contracted operators, 2) take over the services completely and run them without external operators, and 3) put the services up for tendering. The decision faced massive criticism from virtually all bus operators (Alexandersson & Alexandersson, 1995, p. 2), as well as from the opposing right-wing parties in Parliament. It was widely feared that the CPTAs would use their expanded powers to take over operations, leading private bus operators to leave the industry. Therefore, the reform was commonly described as an act of socialization rather than an opening of the market. Much to everyone's surprise, the option to tender turned out to be the one most CPTAs chose to use. The resulting implications for competition and new entry accordingly caused the reform to become known as the "bus deregulation" of Sweden.

Nonetheless, while most CPTAs chose to subject their bus services to tendering, they came to apply this solution in rather different ways. Some CPTAs put up all traffic for tendering at once – in some cases even preceding the reform's mandated starting date, while others introduced tendering in a more gradual and cautious way. A history of conflicts between the CPTA and its contractors tended to make the CPTA more eager to subject services to competitive tendering, while several counties and cities had to consider their interests in publicly owned bus operators, and therefore delayed the introduction of tendering (Alexandersson & Alexandersson, 1995). In Stockholm, where the CPTA was a vertically integrated company including both the planning and operating of bus services, trams and a metro network, tendering was delayed for several years. Tendering was initiated only after the operational side had been divested into several separate companies, which were then given time to adjust to a competitive market environment. A couple of CPTAs were even more cautious, subjecting only new lines to tendering.[12]

[12] The spread of tendering of bus services between 1988 and 2000 is presented by means of a series of maps in Appendix 3, drawing from my compilation of county-specific data on tendering from 1987 to 2003.

As a way to provide for a transition period and avoid a widespread waste of bus companies' assets in case they would not be able or allowed to keep their bus services, the 1985 legislation included an option for them to exit the industry without financial loss. Consequently, they could apply for a controlled dismantling of their operations, with the possibility of receiving cash in hand from the CPTAs as compensation for their assets. The evaluation of such assets was to be carried out by a special committee created for this purpose. As the application deadline for compensation was set to 1 July, 1988, a number of companies chose to apply just-in-case, long before they even knew if their services were actually to be disrupted or tendered. In cases when tendering did not happen, these companies simply withdrew their applications. In some much-publicised cases, companies chose to take part in the tendering process, and if they lost, they asked the CPTA for monetary compensation. Some CPTAs objected to this, arguing that because they had chosen to take part in the tender they had effectively given up their right to be compensated for any losses. However, when this was challenged in court, the bus companies asking for compensation came out as winners (Alexandersson & Alexandersson, 1995, p. 56).

By the late 1990s, most CPTAs had subjected some or all of their local and regional bus services to competitive tendering at least once. Most of the municipality-owned companies had been dismantled, privatised or by other means taken over by other companies. In an effort to protect what was left of municipality-owned operations, the government in 1996 made it possible for municipality-owned companies to also run services in other municipalities (which had been forbidden before unless they made cross-border mergers), opening up the possibility for them to take part in tenders outside of their home market. But it appears this reform came too late to be of any real significance.

Long-distance coaches – a "true" deregulation

During the 1970s the division of Sweden's bus services into local and regional, long-distance, and chartered bus services became more evident. While the CPTAs' area of interest was primarily local and regional (county-wide) public transport, the market for long-distance (inter-regional) bus services was affected by a rather different regulatory framework. Generally speaking, long-distance services by operators other than SJ were restricted in terms of establishment and expansion, upon the basis that SJ's railway services (and also the CPTAs' bus services) needed protection from this kind of competition (SJ, 1986, and Alexandersson, Hultén & Nordenlöw, 1999). Most licences for long-distance bus services concerned so-called weekend traffic (run from Friday afternoon until Sunday). This traffic had been

allowed (and accepted by SJ) since the 1970s, as it was believed necessary to relieve the need for extensive train services at times and on lines characterised by severe capacity constraints.

In conjunction with the Transport Policy Act of 1988 a first step in reforming the market for long-distance bus services was taken. A rule saying that any new long-distance bus line had to pass a test checking if there was really a perceived "need" for the service in question was abolished. Instead, the applicant was required to prove that the new traffic would not be harmful to already established services provided by SJ or the CPTAs. Licenses were granted by a special Transport Council, which in a critical report in 1990 argued that this legislation gave too much protection to the railway services. In a Government Bill (Proposition 1991/92:130) it was suggested that "until a complete deregulation of long-distance bus services could be implemented", the burden of proof was to be reversed. From then on, it was up to SJ and the CPTAs to prove that any applicant's line would really harm their traffic financially. This new order came into force in 1993 and was followed by a stream of new applications. Many of these were approved, but SJ made formal complaints to the government in about 30 cases. On seven lines the government approved SJ's complaints fully or partially, referring to the restructuring process SJ was going through and the introduction of faster trains on upgraded lines. This 1994 decision established a practice to be followed by the Road Administration, which took over the licensing process in 1993.

In 1996 the Competition Authority published a report arguing for a more complete deregulation of long-distance bus services (Konkurrensverket, 1996). It was suggested that additional passengers would primarily come from car users and some price sensitive groups of travellers who currently did not travel at all. In addition, most of the upgrading of the rail network was now completed.

The so-called Kom-Kom report of 1997 (SOU 1997:35) argued against the view of the Competition Authority, asking for an extension of the protection for SJ's train services. At the time of the Transport Policy decision of 1998 it initially seemed most likely that the government would stick to the Kom-Kom proposal, but somewhat unexpectedly the bill instead suggested a deregulation from 1999, getting rid of SJ's (but not the CPTAs') right to block new entry. The deregulation was supposed to enhance the abilities for people to travel and to put pressure on SJ to become more efficient. In practice, the deregulation took effect already in the summer of 1998, when the Road Administration chose to grant licenses to a number of new applicants.

Recent developments – new legislation for all public transport

By the end of the 2000s, the competitive tendering system had come under increasing criticism by several actors of the bus and railway markets. The wide-spread use of gross-cost contracts was believed to erode the profitability of the industry, due to an overly strong focus on costs and a race to the lowest price the operators were prepared to offer. Experiments with various forms of incentive contracts had not lived up to expectations. Net-cost contracts, as used for the procured long-distance rail services (which placed much more of the revenue-side in the hands of the operator), seemed to be a possible way forward, but had proven to be difficult to tender and monitor. More and more tenders were also being challenged in court by one or several of the losing bidders, adding costs to the whole procurement process and causing the risk of delays of new traffic contracts. Thus, the room for true market initiatives apart from in the market for long-distance bus services was still very limited. Moreover, the legislative framework for public transport had become very fragmented.

Parallel to its investigation into abolishing the remaining monopoly powers of SJ (SOU 2008:92), the current centre-right-liberal government instituted a new committee to look into a possible overhaul of all public transport legislation, and thereby also how to handle the delicate interface between commercial and tendered services. The 2009 report (SOU 2009:39) from this committee proposed some profound changes in terms of market organisation and entry that would primarily affect local and regional bus services, but also railway, aviation and maritime traffic. New regional bodies would be established to replace the CPTAs and take responsibility for coming up with annually revised public-transport supply plans. First and foremost, private transport operators would be invited to suggest what kind of traffic they would be willing to run under strictly commercial terms (i.e. without any subsidies). Only traffic not then offered commercially, but still considered socio-economically necessary, would be tendered. After the tender, the authority responsible would award the winning transport operators contracts to perform public transport services by means of service concessions that could grant exclusive rights to run traffic along certain lines.[13]

The committee proposal took the view that non-subsidised services should always be encouraged, and suggested that new operators of commercial services should be allowed to enter with only one month's notice and exit

[13] This was supposed to be an adaptation to the new EU regulatory framework for public transport and the awarding of public-service contracts (Regulation 1370/2007), which came into effect December 2009.

with three months' notice. On the other hand, every operator would have to follow strict guidelines, for example by offering passengers the possibility to change to other operators' lines at certain locations. The proposal was clearly inspired by (and also included case studies of) some supposedly successful examples from Great Britain (Oxford and York) and New Zealand, showing how a cleverly deregulated market, with the right policies and actions from authorities, could be made to work.

The aforementioned proposals would, if instituted, transform the entire market for public services by rail and bus by 2012 (when it was suggested they enter into force). They would in effect erase any differences in the regulatory framework applied for local, regional and long-distance services as well as making the conditions more or less equal for bus and rail services. The focus would then be only to separate commercially viable services (open access) from non-commercial/social services (tendering).

However, in spring 2010, when the government presented its bill for a new law on local and regional public transport (Proposition 2009/10:200), it became clear that it had opted for much more limited changes to the current framework. Although the CPTAs would under this new law indeed be replaced by other public bodies, commercial public transport services would only be allowed *in addition* to the current public transport network. In other words, private firms would be allowed to fill in any gaps or even compete with existing lines, but subsidised networks would still be the basis to build upon, rather than the other way around. The bill was adopted by Parliament in June 2010, but may not survive a possible shift in political power. I will return to this topic in the closing paragraphs of this thesis.

Part 2. Essays

Essay 1

The Effects of Competition in Swedish Local Bus Services

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The Effects of Competition in Swedish Local Bus Services

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1. Introduction

Competition in the public transport industry is gaining momentum in Europe. The approach to deregulation varies from country to country. A central issue is whether the market should be freed completely, or whether the industry may gain (in efficiency terms) from keeping some responsibility areas in the hands of public authorities, such as planning and co-ordination of the bus services. Great Britain is one of only a few countries where a far reaching deregulation — privatisation and dismantling of public control — has taken place. In the Nordic countries (Sweden, Denmark, Finland, and Norway) a partial deregulation has been implemented. The position of the public authorities is still strong, even though the actual operations are, to a large extent, carried out by private contractors.

Eight years have passed since the local and regional bus services in Sweden were deregulated. This evaluation shows that Swedish deregulation has led to considerable gains, while several of the problems associated with British deregulation have been avoided. There are, however, signs indicating that the preservation of the strong position held by public authorities may have been an obstacle to rationalisation. Moreover, the deep recession in Sweden in the early 1990s and the introduction of a value added tax on public transport tickets, have caused a considerable drop in patronage.

2. Deregulation in Britain

Britain is one of only a few countries where a deregulation of some scale has been carried out. (New Zealand is another example, although this deregulation has not been the subject of as many studies as the British deregulation.) British deregulation implied that

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private bus companies became free to start scheduled bus services on a commercial basis wherever they wished, including the freedom to decide on timetables and fares, choice of vehicle type, and so on. The routes that were considered to be unprofitable, but still valuable to maintain from a public point of view, became subject to competitive tendering by public procurement.

In London there was no deregulation. The responsibility for the co-ordination of the bus services remained in the hands of London Regional Transport, which has gradually subjected the services to tendering. This approach, with a preserved public responsibility for the co-ordination of the services, is very similar to the way Swedish deregulation was designed. The political intention for London, however, is that public transport services should be fully deregulated in due time.

Several studies have reported on the results of British deregulation. One of the most frequently cited positive effects is the appearance of innovations, such as mini-buses replacing standard-sized buses on some routes. Partly as a consequence of this, the productivity has improved, for instance if measured as costs per bus-kilometre (see, for example, Heseltine and Silcock, 1990). There has been a 40 per cent decrease in costs per bus kilometre, while the supply of bus-kilometres has increased by about 25 per cent.[1]

Nevertheless, the economic effects of the British deregulation as a whole are considered to be questionable, and some researchers even call deregulation a failure. Demand has decreased by about 25 per cent, despite increased supply. The loss of passengers can only partly be explained by a rise in fares of about 19 per cent resulting from decreased subsidies. Rather, the lack of co-ordination of the bus companies' timetables is considered to be an important explanation (see, for example,Tyson, 1990). Passengers also face other obstacles, such as constantly changing time-tables, for example when companies enter or exit the market, and the problem that tickets for a route are often company-specific (see, for example, White, 1991; and Glaister, 1997). As a consequence of the declining number of passengers, the costs per passenger journey have not decreased since deregulation, but remained unchanged.

In London, however, the development has been quite different. Reductions in costs have been achieved without considerable losses of passengers, despite the fact that subsidies have decreased and fares have increased by the same magnitude as in the rest of the country (see, for example, Nash, 1993, and Mackie *et al.*, 1995).

3. Deregulation in Sweden

Sweden is divided into 24 counties, each with its own elected County Council. The counties are made up of a varying number of local authorities called municipalities. Ever

[1] This is according to the Department of Transport, and refers to the period 1985/86 to 1993/94. Part of the decrease in costs can be explained by mini-bus drivers receiving lower wages compared to drivers of standard buses.

since a major reform at the beginning of the 1980s, the responsibility for public transport in each county rests jointly with the municipalities and the County Council. This responsibility has generally come to be handled by means of special county public transport undertakings formed as limited companies, the shares being owned by the County Council and the municipalities in each county. In all, there are 25 public companies of this kind in Sweden, hereafter referred to as the County Public Transport Authorities (CPTAs). [2] They decide on timetables, fares, vehicle types, and so on. The actual bus services are generally carried out by bus companies working as contractors to the authorities, that is, the bus companies transfer all revenues from fares to the authorities and are in return compensated for their services. Jansson and Wallin (1991) describe the organisation of Swedish public transport, and the background to its deregulation, in more detail.

Before deregulation it was compulsory for the authorities to let the scheduled bus services be performed by those bus companies that had exclusive licences to operate certain routes. Bus companies faced no competition on their routes. Deregulation came into force in 1989, when all earlier road licences were abolished, or rather transferred to the CPTAs.[3] This reform opened up the opportunity, but not the obligation, for each CPTA to promote competition among the bus companies by purchasing public transport services through competitive tendering. Two other options were also available for each CPTA: to continue as before,that is, keeping the former licence-holding bus companies operating the services in accordance with the old contracts; or to begin managing the services by itself. Seven years later, the CPTAs have subjected the majority of the scheduled bus traffic to competitive tendering. At the beginning of 1988, on average only 7 per cent of the traffic volume had been subjected to competitive tendering. In 1995, the corresponding figure was 70 per cent.

The tendering process proceeds in accordance with legislation based upon EU directives for public procurement. The size of the traffic that is put out to tender on each occasion varies — from a single route to all traffic within a county. Typically, the traffic put out to tender is divided into groups of routes referring to specific areas. To make it possible also for incumbent small companies to take part in tendering, it is often made possible for them to bid for their current traffic only (that is, they are not forced to expand in order to be able to take part). After winning a contract by tender, a bus company will not face any competition on the routes specified in the contract until they are put out to tender again, making the situation between tenders similar to that before competition. The contracts usually cover a period of three to five years.

At this point it should be clear that the Swedish reform, especially when compared to the British deregulation, is less radical. It was designed with the main purpose of making it easier for the CPTAs to coordinate and restructure their bus services and to bring down their costs. Most importantly, it is still not possible for bus companies to start up

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[2] This discrepancy — 25 CPTAs spread over 24 counties — is due to a special arrangement in the southwestern part of Sweden. Three of the CPTAs in this area have assigned part of the responsibility for the public transport in their counties to a fourth CPTA.

[3] In a limited number of counties, deregulation actually came into force in 1987, since the CPTAs of those counties had made special agreements on this with all their contractors.

services wherever they wish — neither on new routes nor on parallel routes competing with existing ones. However, the reform did bring in a new option for bus companies wishing to expand their shares within an area and/or entering new areas. Before this, a bus company could only enter by means of acquiring another company and thereby get control of its road licences. Acquiring companies as a way to enter new parts of the market is of course still an option, but in addition, the introduction of competitive tendering has made it possible to enter also by winning contracts at each discrete occasion when a CPTA is putting out bus services for tender. Minor as it may seem, the Swedish reform has nevertheless initiated a sequence of events implying major structural changes in an industry with a market structure that had remained virtually unchanged for decades.

In the sections below, we analyse the effects of the Swedish reform. We will discuss its effects on: (1) market structure; (2) costs; and (3) demand.

4. Effects on market structure[4]

The market structure of local bus transport has undergone considerable change. Out of 13 firms in 1989 with more than 100 buses in operation, only seven remained in 1994. In all, the number of bus companies operating independently has declined from 360 in 1989 to 240 in 1994.[5] It should be noted, however, that old companies have often merged to form new larger entities, or are operating within constellations of co-operating companies. The number of municipally owned companies has diminished substantially, from 40 in 1989 to 21 by the end of 1994.

After losing a tender, the municipally owned companies, in contrast to the private companies, have generally been dismantled or incorporated with the winning company, rather than surviving with a changed focus of operation (such as, charter traffic).

The foremost winners are the dominating companies Swebus and Linjebuss. In total, they have taken control of 664 out of 667 buses being lost by municipally owned companies between 1987 and 1994 (see Table 1).

Swebus (which was state owned until recently)[6] is the largest company in the industry, operating about 2,100 buses in scheduled bus services. In second place comes Linjebuss, a private bus company controlling about half that number. Their combined share of the market amounts to 46 per cent.

Table 2 shows in what ways Swebus and Linjebuss increased their shares from 1989 to 1994. It should be noted that, despite Swebus's apparent net loss in tenders, as opposed to the net gain for Linjebuss, this does not imply that Swebus has been less suc-

4 This section draws on Alexandersson and Alexandersson (1995).

5 Constellations consisting of several cooperating companies have been counted as being only one company.

6 In September 1996, Swebus became privately owned, by means of a bidding process leading to the British company Stagecoach acquiring Swebus from SJ (the state owned railway company).

Table 1
The Fates of the Dismantled Municipally Owned Companies, 1987-94

Company taking over operations	*Lost in competitive tender*		*Could not fulfil contract after tender*		*Sold before tender*		*Total*	
	companies	*buses*	*companies*	*buses*	*companies*	*buses*	*companies*	*buses*
Linjebuss	2	56			3	264	5	320
Swebus	4	109	2	75	3	70	9	254
Linjebuss/Swebus*	1	90					1	90
Other company	1	3					1	3
Total	8	258	2	75	6	334	16	667

* The company's buses were shared between Linjebuss and Swebus.

Table 2
The Growth of Linjebuss's and Swebus's Fleets of Buses, 1989-94

	Swebus	*Linjebuss*
Number of buses operating in scheduled traffic 1989	1879	288
Acquisitions from state owned or private companies	354	163
Acquisitions from local publicly owned companies	254	320
Net losses or gains in tenders	–384	304
Number of buses operating in scheduled traffic 1994	2103	1075

cessful in winning tenders. Rather, taking into account that Swebus had far more buses to *defend* when the tendering began, the two companies seem to have experienced similar success rates.

Other large bus companies are mainly the municipally owned companies operating in the big cities. For example, the third largest company is SL Buss in Stockholm. As has been the case for many other publicly owned companies, SL Buss has had some difficulties when it comes to competing in tenders, and has lost contracts for about 500 buses since the changes. The municipally owned companies have had to cope with certain legal obstacles, in the sense that they have not been allowed to place bids on traffic in areas other than those of their origin. In other words, many public firms have only been able to take part in tenders concerning their own traffic. A way to circumvent this is to form inter-municipal companies. The fourth largest firm, Näckrosbuss, is a company

emerging through several mergers of municipally owned companies in the counties of Sörmland, Örebro and Östergötland.[7]

In summary, seller concentration in the industry has increased considerably. Some claim that the large companies (mainly Swebus and Linjebuss) benefit from considerable economies of scale. The hypothesis is as follows: they are able to utilise their buses more efficiently, they have developed superior routines for calculating their bids, and can afford to take risks when placing bids. A concern is that the large firms will have opportunities for "bid rigging" if the small and medium-sized firms are squeezed out of the market.

5. Has Competition in Local Transport Reduced Costs?

Figure 1 shows how total costs and productivity of the CPTAs evolved during the years 1987 to 1994. At first glance these figures appear to have developed much less favourably in Sweden than in Britain. Total costs increased until the recession began in 1991. After that some expenditure cuts were made, leading to a decrease in total costs. Average cost per kilometre of bus traffic decreased by about 7 per cent in Sweden, much less than in Britain during a comparable number of years after deregulation. Average cost per passenger increased by about 12 per cent in Sweden, while remaining roughly constant in Britain.

The rising costs per passenger reflect a sharp decrease in the number of passengers. On the surface this parallels British experience where the number of passengers also declined. Yet the analysis in the next section shows that the decreasing number of passengers in Sweden was driven by other factors than those pertaining in Britain.

5.1 Econometric specification

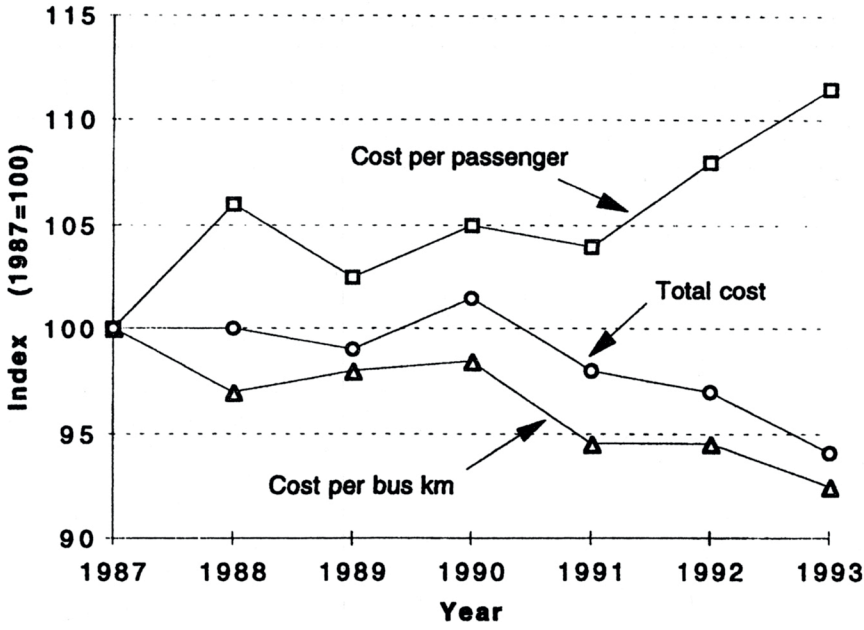
Ideally one would like to analyse the effects of tendering on efficiency, defined as, say, cost per quality-adjusted unit of production. As is often the case, however, we do not have detailed information on quality changes.[8] Even if we did, it would be unclear how consumers value different quality dimensions. Therefore we focus initially on the effects on costs. In a subsequent section the question of quality changes is addressed indirectly by estimating effects on demand.

Deregulation can affect costs through several channels. First, there is the question of whether productivity changes arise from increased competition or from more widespread private ownership of firms. The empirical literature on deregulation has general-

[7] This company was once wholly publicly owned, but in accordance with an agreement of December 1995 the investment company Atle now has a major share.

[8] The haphazardly collected quality information from some counties suggests that quality remained constant, but may have improved in some minor respects: for example, more buses are now suitable for handicapped people and are environmentally cleaner. These changes have occurred across the country, however, and do not affect our estimates of the effects of competition.

Figure 1
The Costs of Public Bus Transport



ly found competition, rather than privatisation, to have a decisive impact on productivity (see, for example, Boardman and Vining, 1989). Second, introducing competition can have direct and indirect effects on productivity. The most important direct effects of tendering are that the current operator reduces costs or is replaced by a new operator with lower costs. In addition, indirect effects may arise for operators who are not currently exposed to competition. The threat of future tendering may encourage these operators to increase productivity in order to be competitive when tendering occurs. Further, operators who have been exposed to a tendering process may adopt new production methods that are later copied by operators who have not yet been exposed to competition.

The size of these indirect effects has rarely been measured. Our empirical material gives us a unique opportunity to separate the direct effects from the indirect effects. In a combined cross-section panel study we can estimate the effect of subjecting part of a county's traffic to tendering on the entire county's costs for the bus services. This estimate comprises the total of indirect and direct effects, and can be compared to the direct cost reductions that the CPTAs report for each completed tendering process.

To study the cost effects of tendering we pool time-series data for each of the 24 counties over the seven years from 1987 to 1993, yielding a total of 168 observations. The regression can be specified in various ways. We begin with the most robust and successful of estimates.

In this specification the dependent variable is the percentage change in real costs, denoted ΔC_c. Analysing the change rather than the level of productivity implies that unobservable county effects are implicitly corrected for. In fact, this is one of the most potent methods of filtering out the effects of time-invariant differences between counties that can affect the cost level. Such differences could be the size of the county, the size of the transport net in a county, the geography, or the level of road congestion. A further reason for using a first-differences regression is that it allows us to test the effects of both the level of tendering and a change in tendering on the rate of cost change. This is explained further below.

An important issue is how to control for changes in the number of bus-kilometres that occur over time. A simple way would be to specify the dependent variable as the change in average cost (cost per bus-kilometre). This would imply the assumption that even transitory changes in the number of bus-kilometres from one year to the next within a county have the same cost effect as long-run differences in the number of bus-kilometres between counties. Such an assumption would, we believe, be far too strong, and might bias the results. Swedish labour laws, and the fact that buses have special design features in each county, imply that the costs for changing the number of employees and buses are quite high in the short run. [9] In addition, bus-kilometres that are added or withdrawn at the margin, and that sometimes reflect transitory changes along existing routes, may require less investment in infrastructure (such as new bus stops) than the average bus-kilometre.

For both these reasons it is important to take account of the fact that a change in the number of bus-kilometres can have a different impact in the short run than in the long run. In the long run we would expect average costs to equal long-run marginal costs. But the short-run marginal costs may be much lower. Therefore our main approach is to enter the percentage change in the number of bus-kilometres as an independent variable (ΔK_c). The estimated coefficient may then be interpreted as the short-run cost increase associated with a marginal change in bus-kilometres. As it turns out, however, a regression specification where the average cost per bus-kilometre is used as the dependent variable leads to virtually the same conclusions about the effect of deregulation on costs.

Our main explanatory variable is the percentage of traffic, in terms of bus-kilometres in each county, run by operators who have been exposed to a tendering process (see Appendix). Two different hypotheses can be tested. First, more tendering may lead to a permanent change in the rate of cost change. This would imply that competition has an effect on dynamic efficiency and that the *level* of tendering ($T_{c,t}$), that is, the total share

[9] This means that reductions in the number of bus-kilometres do not reduce costs as much in the short run as in the long run. Additions of new bus-kilometres, in particular if they are transitory, can be handled by using buses more intensely than is profitable in the long run, that is, by delaying service, cleaning, renovation, and scrapping of buses.

of the traffic that has been subjected to tendering, is a significant determinant of the rate of cost change. Second, an increase in tendering may have a one-off effect on costs, implying a static efficiency improvement. This would mean that only a change in tendering (ΔT_c) — but not the level of tendering — has an impact on the rate of cost change. Lagging and leading effects of these variables are also analysed. Finally, year dummies are included to control for common time effects.

5.2. Results

The coefficient estimates are presented in Table 3. For $T_{c,t}$, the coefficient estimates lie consistently very close to zero, even when ΔT_c is not included at all.[10] Consequently, it appears that there are no dynamic effects — or permanent effects on the rate of cost change — of exposing the bus services to tendering. A possible explanation for this result is that the local traffic authorities plan and control the bus services, leaving little room for operators to experiment with innovations. Another explanation could be that there are in fact dynamic effects that are not captured in the regression. This could be the case if the threat of competition produces dynamic effects in areas that have not been exposed to tendering at all, that are of the same magnitude as the effects that arise in areas that have been exposed.

The ΔT_c variables all have the expected sign, indicating that increases in tendering decrease costs. The current period (year t) coefficient for ΔT_c is statistically significant at the 5 per cent level. The coefficients of the lagging (year t-1) and leading (year t+1) ΔT_c variables are not by themselves statistically significant. However, testing joint significance of the three ΔT_c variables yields a t-value of 7.1, implying significance at the 1 per cent level. The size of the coefficients suggests that a change in tendering from 0 to 100 per cent of a county's traffic decreases current period costs by 6.6 per cent (according to regression 3 in the table). Including leading and lagging effects, costs decrease by a total of 13.4 per cent as a consequence of tendering.

These coefficients are estimated controlling for changes in the production level. Controlling for changes in the number of passengers or the interaction between passengers and bus-kilometres left the results unchanged. The coefficient estimates for the effect of changes in bus-kilometres are significant. Evaluated at the variable averages, they indicate that the short-run marginal cost of an additional bus-kilometre is 4.7 kronor (roughly 0.7 US dollars). This may be compared to the average cost of 15.7 kronor (roughly 2.4 US dollars) per bus-kilometre. The short-run marginal cost should be interpreted as the cost per additional bus-kilometre within the range observed in our data. In no county did the number of bus-kilometres change by more than 5 per cent over the observed time period.

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[10] The estimated coefficients of leading and lagging values of $T_{c,t}$ are, when entered into the regression, always close to zero and non-significant. Therefore such regressions are not reported.

Table 3
Regressions of the Effects of Tendering on Changes in Costs
(t-values in parentheses)

Variables	*Regression 1*	*Regression 2*	*Regression 3*	*Regression 4*
Intercept	0.660*** (8.3)	0.791*** (8.1)	0.752*** (7.8)	0.756*** (7.9)
$T_{c,t}$ (accumulative share of traffic subjected to tendering)	0.00 (0.73)	0.00 (0.75)	0.00 (0.88)	-
ΔT_c, year t (change in share of tendering year t)	-	–0.069** (2.1)	–0.066** (2.0)	–0.057** (1.8)
ΔT_c, year t–1 (change in share of tendering year t–1)	-	–0.028* (1.4)	–0.038* (1.4)	–0.028* (1.4)
ΔT_c, year t+1 (change in share of tendering year t+1)	-	-	–0.030 (1.0)	–0.039 (1.1)
ΔK_c (change in bus-kilometres)	0.29*** (3.2)	0.32*** (3.1)	0.266*** (2.9)	0.27*** (2.7)
Year dummies	incl.	incl.	incl.	incl.
R^2	0.13	0.15	0.15	0.15

Notes:
168 observations.
*, **, ***, indicate that the coefficient is significant at the 10%, 5%, and 1% level respectively.

In order to test how robust our results are, we have also tested other specifications. The first included lagged effects of changes in the number of bus-kilometres. The second used average county costs (cost per bus-kilometre) as the dependent variable, instead of entering the number of bus-kilometres as an independent variable. The third specification included an independent variable that controlled for the average bus speed in a county.[11] All three of these specifications left our estimates of the effects of tendering on costs virtually unchanged, and are therefore not reported.

[11] The measure we use is the share of county bus-kilometres that is conducted in city traffic as opposed to countryside traffic. The estimated coefficient for this variable entered in regression 3 of Table 3 is 0.013 with a t-value of 0.09. Thus the estimated coefficient is small and not significant.

Table 4

Regressions of the Effects of Privatisation on Changes in Costs

(t-values in parentheses)

Variables	*Regression 1*	*Regression 2*	*Regression 3*	*Regression 4*
Intercept	0.882*** (7.236)	0.917*** (6.762)	0.958*** (6.700)	0.836*** (8.513)
$P_{c,t}$ (total market share of private companies)	–0.001 (–0.981)	–0.001 (–0.753)	–0.001 (–1.169)	-
ΔP_c, year t (change in market share of private companies year t)	-	–0.007 (–0.286)	0.005 (0.209)	0.015 (0.609)
ΔP_c, year t–1 (change in market share of private companies year t–1)	-	–0.039 (–1.648)	–0.038 (–1.646)	–0.042 (–1.833)
ΔP_c, year t+1 (change in market share of private companies year t+1)	-	-	–0.025 (–1.077)	–0.016 (–0.727)
ΔK_c (change in bus kilometres)	0.267*** (1.918)	0.260*** (1.838)	0.281*** (2.120)	0.275*** (2.054)
Year dummies	incl.	incl.	incl.	incl.
R^2	0.12	0.14	0.18	0.17

Notes:
168 observations.
*** indicate that the coefficient is significant at the 1% level.

Estimated effects of changes in tendering include, in principle, both direct and indirect effects of tendering. In order to separate them, we compare the estimated effects of tendering on a county's total traffic costs with the cost reductions reported by the CPTAs for each area put up for competition.

Tendering increased over the period by 63 percentage points from 7 to 70 per cent, and the regressions show that an increase in tendering from 0 to 100 per cent has a cost-dampening effect of 13.4 per cent. This implies that the actual tendering that occurred had a cost-reducing effect of 8.4 per cent (0.63*13.4). This roughly matches the reduction in aggregated average costs per kilometre as shown in Figure 1.

The County Public Transport Authorities report cost decreases of 12.9 per cent, on average, in the areas that have been subjected to tendering. This figure can be compared to the estimated 13.4 per cent effect on total costs. Essentially, both are of the same order

of magnitude. This suggests that the indirect effects are small.[12] The conclusion would be that it is not sufficient to introduce competition in one area and hope that indirect effects will give significant cost reductions in surrounding areas not exposed to competition. Rather, tendering has to be conducted everywhere in order to reap the gains of competition.

A few reservations should be mentioned, however. One is that indirect effects may also occur across county borders. Thus there may be a type of "global" indirect effect that we are not able to capture with our data. Another issue is whether the threat of competition has a linear impact on indirect cost reductions. One might assume that indirect effects may be of great importance when the first percentage of a county's bus traffic is exposed to competition, while the effects may be less significant when a late-coming section of the traffic is exposed to competition. To test this hypothesis, we replaced the variables ΔT_c in Table 3 with a dummy for the first occasion that competition was introduced in a county. However, this led to virtually the same results, implying that non-linearities of this type are not particularly important.

Furthermore, we have tested whether the increasing market share of privately owned operators explains the cost reduction better than competition. Replacing the variables $T_{c,t}$ and ΔT_c with measures of the level and the change in the share of traffic operated by privately owned companies (denoted $P_{c,t}$ and ΔP_c, respectively) yields the coefficient estimates shown in Table 4. Clearly, there appears to be no relationship between privatisation and costs. This confirms the earlier referred findings in the deregulation literature.

6. Demand Analysis

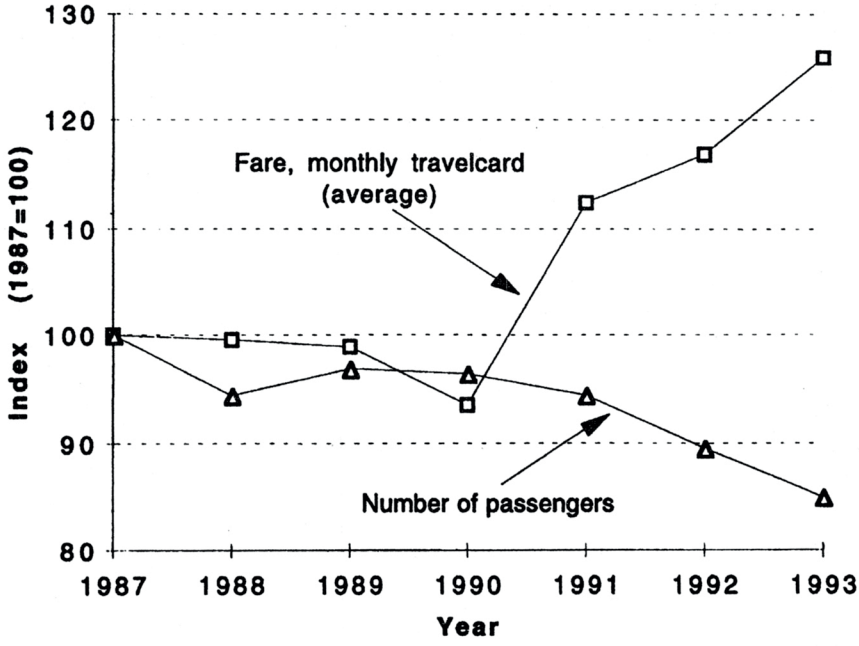
Total demand for travelling by bus has dropped considerably during the period in which deregulation was implemented (Figure 2). However, fares also increased during this period.[13] To a large extent this can be explained by the fact that a value added tax (25 per cent) on public transport tickets was introduced in 1991.[14] In addition, the degree of subsidisation decreased somewhat, from 55 to 43 per cent of total costs. The drastic in-

[12] This comparison can also be made at the level of individual observations. From the regression a predicted county cost reduction can be calculated for every county and year. This can be compared to the cost reduction calculated on the basis of local traffic authorities' reports for tendered traffic (that is, reported cost reduction in traffic put up for tendering multiplied by the share of tendered traffic). The difference between these two measures turns out not to be statistically significant.

[13] Various types of bus ticket are in use in the counties. Generally the most important type is the county-wide monthly travelcard. Typically, it allows the holder unlimited travelling by bus within the county in question for a period of one month (or 30 days). Our data on fares in the counties are restricted to this type of ticket for practical reasons: it simplifies comparisons between counties. Within each county the price trends of other types of tickets usually reflect the price trend of the monthly travelcard.

[14] The VAT rate on public transport tickets was revised several times in the first years following its introduction. Since July 1993 it has amounted to 12 per cent.

Figure 2
Fares and Demand



crease in unemployment (from 2 to 8 per cent of the Swedish workforce) may also have affected demand. A central issue to be analysed is to what extent these factors, rather than deregulation as such, are responsible for the drop in demand.

A priori one would not expect to see demand reductions resulting from the type of search costs that seem to have appeared in the wake of the British deregulation. Since the public bus services in Sweden are still planned and coordinated by the public transport authorities, few changes have occurred in planning, timetables, and information provision. It is conceivable, however, that deregulation has led to changes in quality, such as punctuality, that may have affected demand. Unfortunately, we do not have any direct information about quality changes at the local level.

6.1 Econometric specification

In a true market an estimation of demand parameters requires simultaneous consideration of the supply side. In the Swedish case, however, supply and ticket fares are politically determined and can be considered fixed in the short and even medium term.[15] This simplifies estimation of the demand equation: the supply and fare can be entered as exogenous explanatory variables (denoted $K_{c,t}$ and $B_{c,t}$, respectively). In addition, these circumstances tend to make the estimation quite robust in comparison to simultaneous estimations of supply and demand equations, that are often quite sensitive to the choice of instruments used to identify the equations.

The demand variable is the number of passengers per county and year. All variables are entered in logarithmic form, in order to make it possible to interpret the coefficients as elasticities. The regressions also contain dummies for each year and region. This makes the estimations robust against changes in omitted variables that either differ from county to county, or that change over time in ways that are similar for all counties.

6.2 Results

The regressions are reported in Table 5. Since these regressions are in levels rather than first-differences (as were the cost regressions reported above), it is natural that the adjusted R^2 is much higher. In fact, due to the introduction of year and county dummies the adjusted R^2 is around 0.99 for all specifications. The results show that a fare increase of 10 per cent decreases demand by about 2.3 per cent. This implies a low elasticity compared to results in other international studies. For several reasons, however, we believe that this is a reasonable estimate.

First, one could suspect that there might be larger long-term effects of a fare increase. However, introducing lagging values of $B_{c,t}$ up to three years yields insignificant coefficients that are close to zero. This is not as surprising as it may seem. In general there are two counteracting long-run reactions to a fare increase. One is a long-run adjustment of transport opportunities, such as purchasing a car or moving closer to the place of work. The other is that there may be a short-term over-reaction to large fare increases that reverses in the long run. Thus a publicised large price increase may cause more people to bicycle, walk, or arrange joint travel in cars in the short run, but in the long run some of these will revert to previous travel habits.[16]

Second, the degree of subsidisation is — at roughly 50 per cent — relatively high in Sweden, which means that the fare is relatively low. Thus a 1 per cent increase in the fare in absolute terms would be comparable to a 0.5 per cent increase in fares if there were no subsidisation.

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[15] A Hausman test confirmed lack of simultaneity in our data between demand and supply, as well as between demand and fares.

[16] A much publicised fare reduction by 50 per cent occurred in the city of Trollhättan. In the short run this led to increased demand of about 20 per cent, implying an elasticity roughly twice our estimate. After a while, however, some of this effect disappeared.

Table 5

Regressions of the Explanatory Variables on the Number of Passengers

(t-values in parentheses)

Variables	*Regression 1*	*Regression 2*	*Regression 3*	*Regression 4*
Intercept	9.799*** (6.25)	10.618*** (5.11)	10.791*** (5.22)	10.763*** (5.27)
$\ln K_{c,t}$ (bus kilometres)	0.075 (0.50)	0.010 (0.05)	0.001 (0.004)	0.003 (0.02)
$\ln B_{c,t}$ (ticket fare)	–0.227*** (–3.47)	–0.227*** (–3.33)	–0.233*** (–3.52)	–0.233*** (–3.54)
$T_{c,t}$ (accumulative share of traffic subject to tendering)	-	0.000 (0.42)	-	-
$P_{c,t}$ (total market share of private companies)	-	-	0.000 (–0.104)	-
$\ln E_{c,t}$ (cost per bus kilometre)	-	-	-	–0.096 (–0.74)
Year dummy of 1987	0.129*** (3.47)	0.136*** (2.82)	0.121*** (2.79)	0.124*** (3.26)
Year dummy of 1988	0.085** (2.34)	0.088** (2.10)	0.078** (2.02)	0.080** (2.16)
Year dummy of 1990	0.080** (2.19)	0.084** (2.11)	0.077** (2.06)	0.078** (2.10)
Year dummy of 1991	0.106*** (3.34)	0.108*** (3.25)	0.104*** (3.22)	0.104*** (3.27)
Year dummy of 1992	0.075** (2.42)	0.078** (2.47)	0.076** (2.42)	0.076** (2.45)
County dummies	incl.	incl.	incl.	incl.
R^2	0.99	0.99	0.99	0.99

Notes:
168 observations.
** indicate that the coefficient is significant at the 5% level.
*** indicate that the coefficient is significant at the 1% level.

Third, many counties in Sweden do not have a separate system of school buses. Demand for school bus trips is presumably relatively inelastic, which may affect the estimations.

Supply in terms of bus-kilometres appears to have a negligible effect on demand. This must, of course, be interpreted as a local elasticity. In most counties supply has been fairly constant, and changes occurred mostly on marginal routes that were patronised by few passengers.

Summing the effects of fare-hikes by 27 per cent and the slightly decreased supply explains about 6 percentage points of the decline in demand. The remainder of the 14 per cent decline is largely explained by the year dummies. These presumably capture effects of increased unemployment, changing attitudes or habits, changing costs of car travel, and other factors.

Regressions 2 and 3 in Table 5 show attempts to test how deregulation has affected demand, using the variables for share of traffic exposed to tendering ($T_{c,t}$) and the share of privatised traffic ($P_{c,t}$). Neither of these variables has any explanatory power. Including lagging values of these variables leads to the same conclusion. This indicates that in fact deregulation is not responsible for the passenger decline.

Most municipalities have been under hard economic pressure, at least since 1991. It is therefore somewhat surprising that total costs have not been pushed down further. In a number of counties costs actually increased. Rarely has this cost increase led to an increase in the number of supplied kilometres. Local politicians in these counties often argue that cost increases reflect quality improvements.

Although we do not have a direct measure of quality improvements, we can test indirectly whether consumers have appreciated cost increases in the sense that they travel more. This is shown in regression 4, where the cost per bus kilometre is introduced as an explanatory variable (denoted $E_{c,t}$). The result implies that, on the contrary, cost increases have led to *decreased* demand. A plausible interpretation is thus that increased costs, by and large, are a sign of inefficiency rather than improved quality.

7. Conclusions

During the eight years that have passed since the local and regional bus services in Sweden were subjected to competitive tendering, considerable changes in the market structure have occurred. Seller concentration has increased, privately owned bus companies and the state owned bus company gaining shares mainly from the municipally owned companies.

Our regressions on the development of the transport authorities' costs indicate that competitive tendering has had a significant direct cost-dampening effect, controlling for the number of bus-kilometres. No trace of indirect effects, spreading from areas that have been exposed to competition within a county to the county as a whole, could be detected. This indicates that it is not sufficient to expose only *some* areas to competition, relying on these as a benchmark for the remaining traffic.

The drop in demand that has occurred in recent years, appears to be unrelated to the reform as such. Increasing fares due to taxation are likewise only partly to blame. Rather, other factors, among them the deep recession at the beginning of the 90's, seem to be of greater importance for the explanation of this development.

Appendix
Derivation of the Model Specification

Our model specification is derived as follows. Let costs for bus services ($C_{c,t}$) be composed of county-specific costs that are fixed in the short run ($F_{c,t}$) and short-run marginal costs ($M_{c,t}$). The production in bus kilometres is denoted $K_{c,t}$, and c and t index the county and year respectively:

$$C_{c,t} = F_{c,t} + M_{c,t}K_{c,t}.$$

Let $F_{c,t} = a_c + a_1T_{c,t} + a_2t$, and $M_{c,t} = b_0 + b_1T_{c,t} + b_2t$, where a_c is a county-specific parameter depending on, say, geographical conditions, $T_{c,t}$ is the total share of the traffic that has been subjected to tendering in a county, and a_2 and b_2 are time trends that reflect, say, real wage increases. Substitution gives:

$$C_{c,t} = a_c + a_1T_{c,t} + a_2t + (b_0 + b_1T_{c,t} + b_2t)\ K_{c,t}.$$

Then taking $\Delta C_c = C_{c,t} - C_{c,t-1}$ gives:

$$\begin{aligned}\Delta C_c &= a_c + a_1T_{c,t} + a_2t + (b_0 + b_1T_{c,t} + b_2t)K_{c,t}\\ &\quad - a_c - a_1T_{c,t-1} - a_2(t-1) - [b_0 + b_1T_{c,t} + b_2(t-1)]K_{c,t-1}\\ &= a_2 + a_1\Delta T_c + (b_0 + b_2)\Delta K_c + b_1\Delta(T_{c,t}K_{c,t}).\end{aligned}$$

The estimates of b_1 are never significant, close to zero, and omitting the term $b_1\Delta(T_{c,t}K_{c,t})$ does not change other coefficient estimates. Therefore it is not reported in Table 3.

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Essay 2

Bus Deregulation in Sweden Revisited:

Experiences from 15 Years of Competitive Tendering

Gunnar Alexandersson & Roger Pyddoke

Adapted from a paper presented in 2003 at the

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Bus Deregulation in Sweden Revisited: Experiences from 15 Years of Competitive Tendering

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1. Introduction

In 1989, the exclusive licenses of Swedish bus companies to run certain routes were abolished. The reform made it possible for local and regional public transport authorities[1] to procure bus services by means of competitive tendering. Due to the resulting lowering of entry barriers and increase in competition between bus companies, the reform came to be known as the bus deregulation of Sweden.

In 1998, Alexandersson, Fölster and Hultén published a study of the early effects of competitive tendering (hereby referred to as Alexandersson *et al*., 1998). The period covered was 1987-1994. It was already clear that competitive tendering had resulted in major changes in terms of market structure. Many municipality-owned companies had been dismantled, following their inability to defend their contracts when tendered or through acquisitions. Overall, seller concentration had increased. More than 60 per cent of all traffic had been tendered at least once, and regression analyses of statistical data were used to estimate, among other things, the effects upon costs from increasing the share of traffic subjected to tendering.

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[1] Since a reform in the early 1980s, the responsibility for public transportation in each of Sweden's counties (today 21, following some county mergers), rests jointly with the municipalities and the County Council. In practice, this responsibility has generally come to be handled by means of special undertakings formed as limited companies, referred to as the County Public Transport Authorities (CPTAs).

In 2001, the continued use of competitive tendering has meant that almost all areas in Sweden have been tendered at least once. This makes it reasonable to have another look at the development of the Swedish bus industry, trying to disclose the long-term effects of the introduction of competitive tendering. In the literature on transport reforms, researchers have often found it useful to follow up on earlier studies to reassess the development (see for example Mackie, Preston and Nash (1995) and White (1997) on British bus deregulation, Preston (2008) on rail franchising in Britain, and Preston (2005) and Nash (2008) on deregulation and privatisation of public transport – both bus and rail). By doing this one may for example identify new phases in the evolution of market structure and competition.

Consequently, it seems relevant to re-evaluate the Swedish bus deregulation, asking questions such as: Have the previously identified trends continued, or has the industry entered a new phase? Are the previous conclusions on cost effects still valid? The objective of this paper is to answer questions like these, adding another eight years of evolution to the analysis (thereby covering the period 1986-2002), To this end, we will use both descriptive statistics and a partial replication of one of the earlier regression analyses.

2. The development 1987-2002 – an overview

The first tenders of local and regional bus services took place in 1987 (coming into effect in 1988), preceding the actual reform with almost two years. This was made possible through special agreements reached in the regions in question. Typically, the first tenders resulted in large reductions in costs and some spectacular shifts of operators. Municipally-owned bus companies lost shares (and were often dismantled) to private companies. The privately-owned operator Linjebuss was very successful during these years. In 1990, competition caused the national state-owned railway operator, SJ, to merge its two bus operators GDG and SJ Buss, forming the market leader Swebus. For several years, only Swebus and Linjebuss were active as bidders all over the country. Although both companies tended to win tenders roughly equally often, Linjebuss was the one that really grew, basically because Swebus had more traffic to defend from the beginning. Linjebuss increased its share of the market from 4 per cent in 1989 to 16 per cent in 1994, while Swebus grew from 24 per cent to 28 per cent, mainly by means of some large acquisitions not related to tenders.

In 1994 the market entered a new stage in its development. Several mergers of publicly-owned companies finally resulted in the creation of Näckrosbuss, another large operator active in several regions. At about the same time, a couple of so-called bus groups, companies formed in order to

facilitate co-operation between large numbers of mostly small private firms, started to be successful in several important tenders. One of them is Buss i Väst, formed by 50 minor companies. Consequently, the growth of Linjebuss and Swebus came to a halt, and competition remained fierce.

While both Linjebuss and Swebus had been rather successful in winning tenders abroad too (primarily in Denmark and Finland), it was not until 1996 that a foreign operator became established in Sweden. This was when Stagecoach acquired Swebus from SJ, marking a major shift in the balance of private and public ownership. In early 1997, the Danish operator Bus Danmark (then publicly-owned) entered the southern part of Sweden by means of acquiring the private firm Ödåkra Buss, expanding its platform in advance of taking over services gained in a tender. Later the same year, the French company CGEA (later Connex) started to buy Linjebuss shares in a major way, ultimately leading to a complete take-over in early 1998.

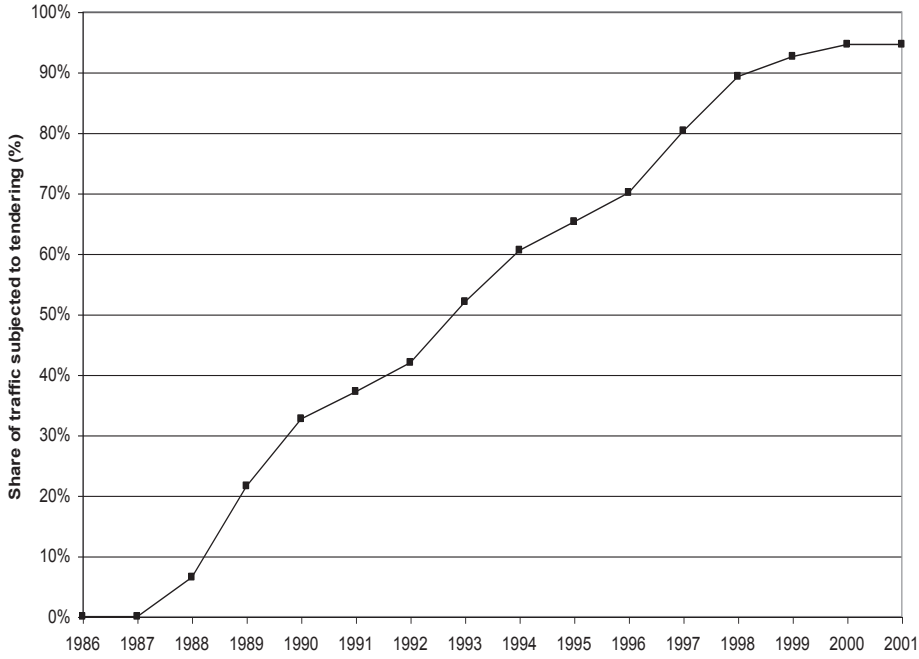
Major structural changes continued in 1999. In the beginning of the year Näckrosbuss (then semi-privatised) merged with the large publicly-owned operator of Stockholm, SL Buss, forming Busslink. Busslink thereby instantly became Sweden's second largest operator. Later the same year, Arriva took over Bus Danmark, thereby also establishing itself on the Swedish market. The year ended with Stagecoach selling Swebus to Concordia Bus, a company owned jointly by National Express and the Norwegian Schöyen group. Some of these changes were linked to plummeting profits in the industry. Towards the late 1990s, the bus operators were increasingly complaining about increased costs not being compensated by the amounts paid according to the contracts. In some tenders, especially from 2000 and onwards, contract levels increased substantially. For a while, net-cost contracts, rather than the industry standard gross-cost contracts, were commonly praised as the solution. After some failing experiments with these types of contracts, however, it appears as if gross-cost contracts or contracts with only limited sharing of ticket revenues will continue to dominate.

In 2001, Busslink went into a financial crisis after having won some tenders with too low bids. The private owners left the company and for a period it again became entirely publicly-owned. In 2003, however, it was partly (70 per cent) sold to the French company Keolis. Consequently, companies originating in other EU countries had come to control the majority of the Swedish bus sector.

Figure 1 presents an overview of how the accumulated shares of tendered traffic have developed from 1986 and onwards, in terms of county averages. In 2001, about 95 per cent of all services had been tendered at least once. The only remaining areas were a couple of cities in the north of Sweden and a majority of the services in the county of Västmanland. Since almost all traffic has already been tendered, new tenders are no longer attracting much interest

in news reports or among the public. However, the market is far from static. Competition appears to be vivid and operators come and go, although new and fast-growing companies are rare. There are a couple of examples of interesting new companies, but if they grow large enough they will probably become acquired by one of the largest firms.

Figure 1. Development of shares of traffic subjected to tendering (average values)



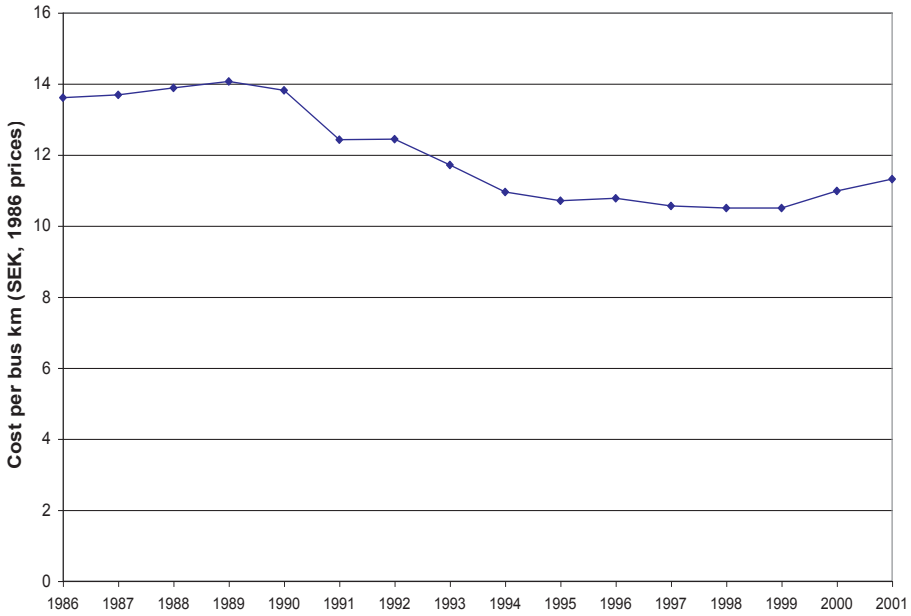
3. Tendering and its effects upon costs

3.1 Overview, previous results and hypotheses

A compilation of a large number of studies on procured services leads to the conclusion that competition rather than private ownership lowers costs (see e.g. Domberger and Jensen, 1997), although this conclusion has been questioned by, among others, Boardman and Vining (1989). Another widely observed effect of competitive tendering has been its potential to reduce the costs of service delivery, i.e. induce savings in the subsidies paid by procuring authorities to their contracted operators (see for example Hensher & Wallis, 2005, for a review).

Figure 2 presents a picture of how the costs per bus kilometer have developed since 1986, as an average for all Swedish County Public Transport Authorities.

Figure 2. Development of costs per provided bus km (average values)



From 1989, when tendering really took off, an obvious trend of lower costs for providing bus services may be observed, while costs are rising again from 1999 and onwards. In 1993, average costs had been reduced by 16 per cent to 11.70 SEK/bus kilometer. This was the last year of statistical data in the previous study by Alexandersson et al (1998). Since 1999, the average accumulated share of services subjected to tendering at least once has been fairly stable and in the years 2000 and 2001 costs are increasing. Nevertheless, the level of 2001 (about 11.30 SEK per bus kilometer) is still below the level of 1993.

It is important to note that many traffic authorities have several medium to long-term contracts and that only a minor share of these are being re-tendered during a particular year. This implies that there is a certain amount of inertia affecting the impact of tendencies of increased or decreased costs upon total costs.

The starting point for the study of cost effects by Alexandersson *et al.* (1998) was the formulation of two hypotheses. Firstly, it was suggested that

an increase in the share of tendered traffic would lead to an effect on dynamic efficiency and therefore a permanent change in the development of costs. Empirically, this would mean that the accumulated share of tendered traffic should have a substantial and significant effect upon observed cost decreases. Secondly, it was suggested that an increase in the share of tendered traffic would result in a one-off effect upon costs. In this case, only a change in the share of tendered services, rather than the accumulated share, would have an impact upon costs.

Alexandersson *et al.* (1998) analyzed a model for the costs of the traffic authorities in which production costs are assumed to include fixed costs and marginal costs. Fixed costs are also assumed to contain one element corresponding to local factors and one component depending on the share of services subjected to tendering, and on the development of wages. By studying percentage changes in costs, the differences between authorities and their areas not affected by time are eliminated. Examples of such differences are the size of the traffic, economies of scale and scope between lines, average speed and congestion.

Alexandersson *et al.* (1998) used ΔC (percentage change of total costs) as a measure of the dependent variable "cost changes" rather than Δc (percentage change of unit costs). With this projection, the coefficient for the independent variable ΔK, K being the supply of bus kilometers, may be interpreted as the short-run marginal cost. Using Δc instead implies an assumption that short-run changes in costs are equal to long-run marginal costs (ibid, p. 210). Alexandersson et al (1998) also noted that the resulting estimates differed only slightly if Δc was used as the dependent variable instead of ΔC.

3.2 The current data set

One important objective of the current study was to use time series data for the extended period 1986-2001.[2] In order to achieve this, it was found necessary to partly revise the figures corresponding to the period covered by the previous study. Firstly, a rough adjustment of some data has been made in order to improve the possibilities to compare the development of produced traffic volumes over time. This was necessary since many authorities are now reporting only the amounts of bus kilometers run in actual time-tabled services, while previously buses running empty to and from garages were also included. Secondly, data from non-calendar years have been pooled and recalculated to corresponding calendar years. Thirdly, we have been more careful in establishing the exact time when tendered contracts have come into

[2] 1986 was chosen as the first year of the period in order to include the last year before any tendering procedures started.

effect, in order to get a better representation of when the amounts of tendered traffic have increased.

Consequently, the new data set differs in some respects from the previous data set, and therefore the econometric analyses performed in this study may not be viewed as exact replicas of the previous study. Nevertheless, it is interesting to compare the results and their interpretation, especially when it comes to judging whether the reform has been successful or not.

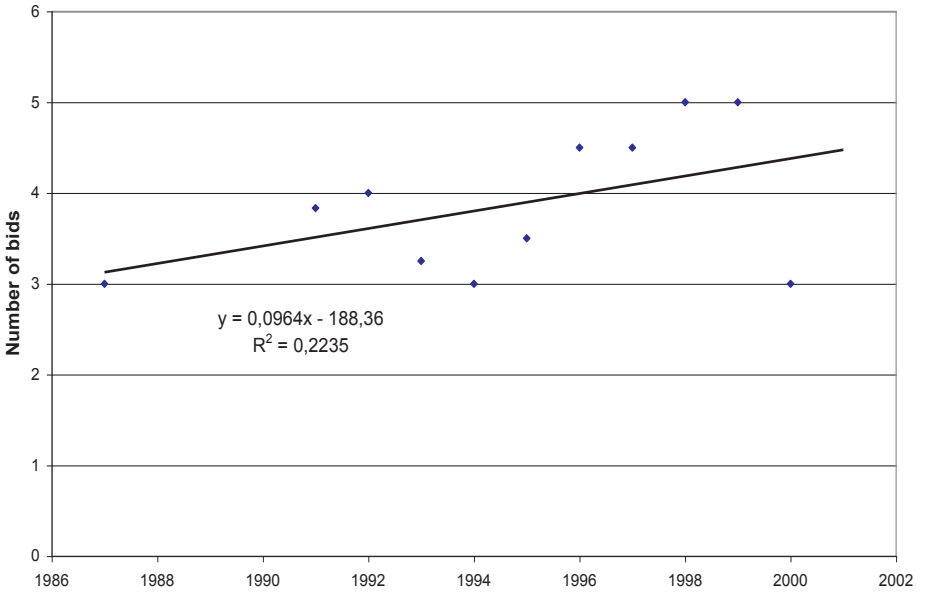
In this study, we use annual data from 23 public transport authorities for the period 1986 to 2001.[3] The data originates from the traffic authorities' own reports on the supply of bus kilometers and the total costs of bus services. The data on costs have been adjusted for inflation, using the national KPI (Consumer Price Index). Consequently, all costs are in 1986 prices. There has been a fierce debate in the industry on the usage of KPI for adjustment of contract levels. Representatives of the bus operators have argued that costs of production have increased much more in the bus industry than is reflected by the KPI. It might seem as a simple task to get alternative indices comprising the most important cost parameters of the operators. In the past, there have actually been other indices in use, compensating the operators for cost increases beyond their control. However, the production of these indices was interrupted in the early 1990s. A similar index is now again compiled and published by *Bussbranschens Riksförbund*, an organisation representing the operators. However, the lack of a complete time series of an alternative index covering industry-specific cost parameters has nevertheless forced us to go with the KPI. We made a test using data on wages and the price of diesel fuel (for the years 1995-2001) indicating no strong correlation with the observed changes in costs. In the model we have however included annual dummies, which should capture a great deal of any unique changes in costs.

There is reason to believe that the projected number of bidders in a tender may influence bid levels and thereby the costs of the traffic authorities. Finding data on projected bidders is not really possible, but we have collected data on the number of actual bids in a sample of tenders. The idea was to include all tenders of certain urban areas of some magnitude (above 60,000 citizens), since they tend to be well-defined and attract several bidders. As it turned out to rather time-consuming to collect this kind of data, and some values were missing, we ended up with information from tenders in the cities

[3] The previous study included data from all of Sweden's then 24 counties. Despite the fact that Sweden now has only 21 counties, we have been able to find separate data for the whole period corresponding to the same administrative division as in the previous study – with one exception – Skåne county (created through the merger of Malmöhus and Kristianstad counties), which therefore had to be treated as one county for the whole period. Consequently, the number of counties included are 23.

of Stockholm, Göteborg, Uppsala, Jönköping, Lund, Gävle, Halmstad, Karlstad and Växjö. The limited data set showed that the number of included tenders varies from year to year and for some years is even zero.

Figure 3. Number of bids in tenders for bus services in urban areas (average values)



Consider the development of the average number of bids (Figure 3). The figure includes our values from the years where data is available along with a linear trend. Interestingly, the average number of bids increased during the second half of the 1990's. Since data is limited we should be cautious with our conclusions. Nevertheless, the result is perhaps not so surprising when we take into account that mergers and other events have implied that there has probably been a real increase in the number of companies operating in several counties rather than only locally. In the early years, a tender of city services typically attracted primarily Swebus, Linjebuss and the incumbent local municipally-owned company. Most of the latter are now since long gone as individual companies. Instead, we have seen the creation of Busslink out of a series of mergers of publicly-owned companies, the appearance of bus groups of co-operating private firms, and the entry of Arriva by means of acquisitions. Some other firms have also increased their willingness to place bids outside their county of origin. Consequently, the number of potential bidders for city services may actually have increased.

Data on the average number of bids was originally intended to be used as a "competition variable", to be entered in one estimated model. However, lack of data for whole regions (rather than some urban areas) and additional problems with data missing for a couple of years, made such an estimation seem too inconclusive to be of any real value.

3.3 Modeling and estimated results

Alexandersson *et al*. (1998) presented estimations of (among others) the following model:

$$\Delta C_t = \alpha + \beta_1 T_{i,t} + \beta_2 \Delta T_{i,t} + \beta_3 \Delta T_{i,t-1} + \beta_4 \Delta T_{i,t+1} + \beta_5 \Delta K_{i,t} + \gamma D_t + \varepsilon$$

In this equation, ΔC_t is the percentage change in total costs in the year t, $T_{i,t}$ is the accumulated share of tendered traffic in county i in the year t, $\Delta T_{i,t}$ is the change (in percentage points) in the share of tendered traffic in the year t, $\Delta T_{i,t-1}$ is the change in the share of tendered traffic in the year t-1, $\Delta T_{i,t+1}$ is the change in the share of tendered traffic in the year t+1, and $\Delta K_{i,t}$ is the percentage change in the supply of bus kilometer (counted as thousands). D_t are annual dummy variables. The estimated parameters are the coefficients β, γ and the intercept α. One set of observations is omitted at each end of the time series in order to construct the leading and lagging variables.

Regression no. 1 in our study was designed to be compared to Regression no. 3 in Alexandersson *et al*. (1998, p. 212), but now using data for the extended period 1987-2000. This model was used in the previous study to estimate the cost effects of increasing the shares of tendered traffic. The results appear to be similar in most respects (see Table 1).

The central parameter is the coefficient for the change of the share of tendered traffic, $\Delta T_{i,t}$. In our estimation, this coefficient amounts to –0.055 instead of –0.066 in the old regression. This would mean that costs would decrease by 5.5 per cent if the share of tendered traffic increases from 0 to 100 per cent. The effect is significant at the 5 per cent level. Consequently, replicating the model of Alexandersson *et al.* (1998) with revised data for a longer period shows that the cost effect from tendering is slightly smaller but equally significant compared to the results of the previous study for the shorter period.

Table 1. Regressions of the effects of tendering on changes in costs (t-values in parentheses)

Variables	Old regression[a]	Regression 1[b]	Regression 2[c]
Intercept	0.752***	2.04**	1.92**
	(7.8)	(2.4)	(2.2)
$T_{i,t}$ (accumulative share of traffic subjected to tendering)	0.00	0.010	0.017
	(0.88)	(0.45)	(1.31)
$\Delta T_{i,t}$ (change in share of tendering year t)	–0.066**	–0.055**	–0.063**
	(2.0)	(–1.7)	(–2.5)
$\Delta T_{i,t-1}$ (change in share of tendering year t-1)	–0.038*	0.011	-
	(1.4)	(0.35)	-
$\Delta T_{i,t+1}$ (change in share of tendering year t+1)	–0.030	–0.018	-
	(1.0)	(-0.71)	-
$\Delta K_{i,t}$ (change in bus kilometres)	0.266***	0.227**	0.224***
	(2.9)	(2.8)	(3.2)
Year dummies	Incl.	Incl.	Incl.
R^2	0.15	0.32	0.32

Notes:
*, **, ***, indicate that the coefficient is significant at the 10%, 5% and 1% level respectively.
[a] Regression no. 3 in Alexandersson *et al.* (1998, p. 212).
Includes the years 1988-1992 (when leading and lagging variables are calculated). 120 observations.
[b] Includes the years 1987-2000. 322 observations.
[c] Includes the years 1987-2001. 345 observations.

The accumulated share of tendered traffic $T_{i,t}$ appears to have no impact on changes in cost, neither in our new regression nor in the previous study. Therefore, we cannot find any dynamic cost effect of tendering bus services.

The new regression results in slightly increased costs as an effect of increasing the shares of tendered traffic the previous year, the coefficient for $\Delta T_{i,t-1}$ being 0.011 as opposed to –0.038 in the previous study. However, the estimate is not significant at the 5 per cent level in either of the two regressions.

The cost effect of increased share of tendered services the following year is slightly lower in the new regression compared to the old one, the coefficient for $\Delta T_{i,t+1}$ being –0.018 compared to –0.030. Again, the results are not significant in either of the regressions.

The new estimate of the cost effect from changes in the supply of bus kilometers ($\Delta K_{i,t}$) turns out to be very similar to the previous study. The coefficient is 0.227 and is significant at the 5 per cent level. In Alexandersson *et al*. (1998), the coefficient was 0.266.

Consequently, the main differences between the results of the new regression 1 and the old regression seem to be the estimates of the coefficients for the leading and lagging variables, although only the leading variable came out as significant (and then only at the 10 per cent level) in the previous study. It is possible that our refined data on when the result of the tenders actually took effect has served to eliminate some of the leading and lagging effects. In an alternative regression, listed as no. 2 in the table, we skipped the leading and lagged variables completely. The result was mainly a larger (negative) coefficient for $\Delta T_{i,t}$, –0.063, and still significant at the 5 per cent level.

From the results of the regressions in Alexandersson *et al.* (1998), the authors concluded that tendering had reduced costs by 8.4 per cent between 1987 and 1993. This figure was calculated by adding the coefficient for $\Delta T_{i,t}$ (–0.066) with the coefficients for the leading and lagging variables (–0,038 and –0.030 respectively) and then multiply the resulting sum (–0.134) with 0.63 (corresponding to an increase in the share of tendering amounting to 63 percentage points). A similar calculation based upon our new regression has been made. According to the revised long-term data set, the share of tendered services increased from 0 to 95 per cent between 1987 and 2000. Adding the coefficients (–0.055+0.011–0.018 = –0.062) leads to the result that increasing the tendered share from 0 to 100 per cent share would lower costs by 6.2 per cent. According to the new regression the cost effect from tendering between 1987 and 2000 is therefore –0.062 * 0.95 = –5.9 per cent. If we instead go with the coefficient from regression 2 (skipping the leading and lagging variables) we end up with the value –0.063 * 0.95 = –6.0 per cent, i.e. essentially the same amount.

In this calculation we have not included the effect from changes in supplied traffic volumes. The fact that production decreased by 12.6 per cent between 1987 and 2000 would, with the new regression, account for a change in costs of 0.227 * –0.126 = –2.9 per cent. Adding this to the cost effects of tendering would lead to a sum of about –9 per cent, amounting to about half of the 20 per cent reduction of average costs that has occurred since 1987 (according to Figure 2).

4. Discussion and conclusions

The introduction of competitive tendering in the Swedish bus industry in the late 1980s has had a profound impact upon the development of the industry. The market structure has changed dramatically, not least in terms of private and public ownership of operating firms. Privately-owned companies have now come to totally dominate the industry, and the major ones are all owned by conglomerates of foreign origin.

It is clear that the public transport authorities have enjoyed a long period of decreased costs, coinciding with the increase in the share of tendered services from 0 per cent in 1987 to 95 per cent in 2001. After 1999, however, costs are on the rise again. Similar to the previous study by Alexandersson *et al.* (1998), we have tried to establish the relationship between tendering and these changes in costs. Both the previous study and the current one have been able to find a rather strong evidence for this relationship. The change in the share of first-time-tendered traffic has clearly had some dampening impact upon costs, also during the latter part of the 1990s, even if – when the whole period is taken into account – the magnitude of this effect turns out to be somewhat lower compared to the expectations from the results of the early years, as reported in the previous study. Similar to the previous study, we find that the accumulated share of tendered traffic generally seems to have a weak effect upon costs, confirming that there are no evident dynamic effects from tendering.

It is possible that tendering actually had had a greater impact on costs than has been possible to reveal in both this and the previous study. For example, the transport authorities may have used the money saved to pay for increased quality. Since we yet lack measurable data on the development of quality aspects, it is hard to tell whether this is reasonable or not. The authorities themselves often claim that quality has increased, e.g. in terms of the average age of vehicles, pollution and other environmental concerns, and the possibilities for disabled persons to use ordinary buses. Looking at the results of some individual tenders seem to support this view, but in order to settle the matter, a comprehensive set of quantifiable quality variables related to tenders would have to be collected. Unfortunately, collecting this type of

historical data is time-consuming, costly and perhaps not even possible. One overall conclusion, linked to this discussion, is that it would be preferable to improve the control for other sources of cost changes.

It is also possible that the fact that the period we study is so long influences the possibilities to analyze the relationships by means of simple linear models. The development of costs in several counties may follow a u-shaped curve (as is partly indicated in Figure 2). A related issue is the fact that in many counties, no real changes in the accumulated share of tendered services occurred during the latter part of the period. For example, this is the case in the counties that tendered 100 per cent of the services at one go already in the late 1980s or early 1990s. To conclude, more research is definitely needed. One interesting option would be to create a refined data set, taking into account that some parts of the traffic have been tendered once, some twice, and some thrice, and so on. This would make it possible to estimate a model comparing the effects of initial tenders with those of repeated tenders, getting a better understanding of the long-term conditions for workable competition in the industry.

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Essay 3

The Swedish Railway Deregulation Path

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The Swedish Railway Deregulation Path

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Abstract

This paper deals with railway deregulation and related reforms by means of a case study of Sweden, studying the 1988 split of railway infrastructure from operations and the subsequent steps of vertical and horizontal disintegration to a market characterized by decentralization and intra-modal competition. We also analyze the current market situation, in terms of the actors and their roles, and industrial organization measures. This assessment is used to discuss the sustainability of the current regulatory structure, concluding that although it seems more sustainable than in the past, regulators will sooner or later have to deal with some of its inconsistencies.

1 Introduction

Since the late 1980s, several countries in Europe have gradually started to reform their national railway monopolies, using vertical separation of infrastructure from operations, introducing intra-modal competition by various procedures and contracts, and sometimes partial privatization of the railway industry. While some countries have clearly been pioneers in this respect, we have also seen the rise of common EU policies, eventually affecting all member states.

In this paper, we discuss the Swedish process of reforming the railways in the past decades. The first part of the paper deals with the economic and legal reasons for a deregulation of the railway sector and discusses the potential contribution of case study research of regulatory reforms. In a second part of the paper, we turn to Sweden, looking at the development since 1988, including the most important effects and the current market situation. This assessment is then used as a foundation for a concluding discussion of the direction of the evolution of the Swedish reforms and the sustainability of the present regulatory structure, set in the context of the agenda for further reforms on the EU level.

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2 Perspectives on railway deregulation

Deregulations are commonly linked to market transitions that involve privatization, the transfer of public ownership and management to the private sector. According to Vickers and Yarrow (1991) privatization of former public enterprises and services can take three forms: 1) Privatization of competitive firms – the transfer to the private sector of state-owned enterprises operating in competitive markets. 2) Privatization of monopolies – transfer to the private sector of state-owned enterprises with substantial market power. These firms can either be natural monopolies (like electricity transmission) or "artificial" monopolies, where competition from foreign or domestic firms could exist. 3) Contracting out of publicly financed services, previously performed by public sector organizations.

The economic motives for privatizing a public monopoly compared to replacing a public monopoly with competition are quite different. There exists a widespread agreement that the replacement of a public or publicly guaranteed private monopoly with competition between competing firms results in improved efficiency. The efficiency gains are less clear for the transfer of a public monopoly to private ownership. In this case, it seems that the regulatory policy is crucial for preventing negative effects of monopoly power. The motives for selling a public monopoly are rather found in the need to find revenues for the public sector or avoiding public spending in the future.

The research on the deregulation of the American railroad industry in the period 1976 to 1980, most importantly the Staggers Rail Act in 1980, has nearly exclusively focused on the freight sector and the deregulation's effect on price and quality (Uri and Rifkin, 1985; McFarland, 1987; and Wilson, 1994). The American railway market is predominantly a freight market and the principal goal of the deregulation was to allow the private railway operators more freedom of action. The European (EU) deregulation context 15-25 years later is radically different from the US deregulation. EU railway networks serve both passenger and freight markets, and both these markets have been deregulated. Deregulation in Europe means both changes in the regulatory structure and a gradual or complete privatization of the former vertically integrated state monopolies. The major arguments for reforms, as stated by the European Commission, have been to create a common European market for railway transportation services, railway material and equipment, and to overcome different technical standards and other obstacles in order to make the railways more competitive compared to other modes of transportation. The freight sector has been relatively more deregulated than the passenger services and it should be possible to rerun the research from the US deregulation on the EU experience. Levin (1981) cautioned against being too optimistic about the possibilities of achieving optimality in the deregulated market. He suggested that in the case of railroads, indivisibilities, pervasive economies of joint production, and high costs of entry leading inevitably to small-numbers competition in the deregulated market, pose problems of the regulatory framework after deregulation. His solution was to safeguard "workable inter-railroad competition" and to use price ceilings to reduce deadweight loss in a future monopolistic market.

Four broad types of deregulation approaches are apparent in the member states of the EU. The British rationalist approach, the Swedish incremental approach, the German and Dutch "wait and see" incremental approach and the French late compliance approach. In comparison with EU legislation, the British deregulation has nearly always been substantially ahead, the Swedish deregulation in most cases ahead, the German and Dutch in tune with EU legislation and the late compliers significantly behind. (See, for example,

Héritier *et al* (2001), for a thorough discussion of the EU impact on railway reforms and the differences in national policymaking between UK, France, Germany and the Netherlands.)

The British deregulation was initiated and carried out during a relatively short time period from 1994 to 1997, and consisted of a break-up vertically and horizontally and total privatization of the former integrated monopoly. The deregulation created three types of private companies that came to dominate the post-deregulation market. Railtrack got the responsibility for the infrastructure, rolling-stock companies (Roscos) became owners of the rolling stock (then leased to the operators), and 25 train operating companies took control of the railway services. The operators were selected using a franchising procedure, characterized by competitive bidding, where the lowest demanded subsidy (or even highest payments to the Government) was among the most important selection criteria. New Governmental bodies, such as the franchising authority OPRAF and the Rail Regulator were supposed to monitor the market actors. Since then, the institutional framework has subsequently been altered on several occasions. Railtrack has in effect been renationalized, new public agencies have replaced the former and the subsidies have not decreased according to the initial plan. The Swedish case history (presented in more detail below) shows that similar changes have occurred, albeit at a slower speed. The retrograde steps have also been fewer and less dramatic.

The British deregulation of the railway sector used the two last privatization measures mentioned above – privatization of monopoly rights and contracting out of public services. Most of the deregulation examples from other EU countries are primarily of the third type. However, some countries have transferred former monopoly firms to private or foreign firms. For example, Denmark and the Netherlands have sold their national railway freight companies to Railion – a firm originating in the former freight division of Deutsche Bahn.

The deregulation of the railway sector in the EU member states seems to have been driven by different types of economic, institutional and legal concerns. In Britain, we find that the pursuit of a market liberal agenda has dominated. In Sweden, key concerns have been the need to find new ways to finance investments in the railway sector, and to increase efficiency through competition. In countries like France and Portugal the initial most important factor seems to have been the necessity to act in accordance with EU legislation. However, both countries have later begun to exploit the potential of the reforms, with attempts to attract new actors and introduce actual competition (see, for example, Railway Gazette International (2006)).

The research on the railway deregulation in Europe has to a large extent looked at the effects of competition in terms of lower subsidies, productivity changes and entry barriers. Some observers have questioned if the European solution with vertical separation and competitive tendering is a better option than (for example) a privatization of the former state monopolies. They argue that scale economies in operation, indivisibilities and economies of vertical integration are too significant to be overlooked (see for example Ehrmann, 2003). The British deregulation has been much discussed and different aspects of the rapid deregulation have been criticized. Nash and Smith (2006) have pointed at the disappointing long-term development of train operator costs that followed after the early promising projections. Yvrande-Billon and Menard (2005) suggest that transaction costs may have been higher than expected because of a lack of coordination between contract lengths and the assets (rolling stock) used for railway services. This result in a

misalignment: an arrangement in which the characteristics of the mode of organization do not fit the attributes of the transaction it has to organize.

From the discussion above, we can notice that the European deregulation of the railway system has been different than the American deregulation. Price and quality changes of the freight services are far from the only concern in European research. The European countries advance at different speed using different ways of deregulating the railway system resulting in relatively smaller samples than in the US railway freight market. We therefore argue that case study research has a more important role to play in the European case than in the research of the American deregulation.

This article has three objectives. The first objective is to describe the deregulation process in Sweden and the current railway system with its regulatory structures and actors in the form of a case study. The second objective is to analyze the present railway markets in some simple industrial organization measures: concentration ratios, barriers to entry, transaction costs, vertical integration and economic efficiency trends. The third objective is to discuss the sustainability of the Swedish regulatory reform path and critical issues for the future.

3 A principal discussion on case studies

The research method in this article is a reconstructed case study, based on interviews, reports, annual reports, political documents, press releases and scientific articles. The regulatory reforms in the European transport sector have to-date been discussed and analyzed in a large number of case studies. Some case studies have a theoretical orientation, using theoretical constructs to question how efficient the reforms were, such as the transaction cost analysis of Yvrande-Billon and Menard (2005). Other case studies use industrial organization concepts – measures of industry concentration, horizontal and vertical disintegration and so on – to analyze the regulatory reforms (Alexandersson *et al*, 2000; Nash, 1993; Nilsson, 2002; and Preston, 2001). A third type of case study is nearly purely descriptive; see, for example, Kirchner (2005) and most of the contributions in Van de Velde (1999), presenting how far deregulation has proceeded and the nature of the reforms. These case studies answer to a demand for general information on the deregulation movement by public agencies, private firms and researchers. We position this article as being somewhere in between the first and the second type of the case studies.

There is a long tradition of using case studies as analytical tools for research within the field of Industrial Organization, dating back to pioneering work by, for example, Marshall, Chamberlin and J. M. Clarke. Detailed empirical studies of specific industries have given input to a better general understanding of industries, markets and firms, also contributing to theoretical development. Statistical analysis and econometrics are traditional tools but qualitative information gathered by direct observation and interviews has also been shown to provide supplemental economic evidence to various propositions (Borenstein *et al*, 1998). Proponents of a grounded theory approach to developing economic theory and generalizations specifically point at the systematic and comparative use of both qualitative and quantitative case studies (Finch, 2002).

Case studies are also believed to be a highly useful tool for researching industries in transition (Westgren & Zering, 1998), such as when regulatory reforms and increased competition set of a transformation of industry market structure. By using case studies

where the unit of observation is a specific country and its experiences from industry reform and transition, it may be possible for economists to, for example, provide policymakers in other countries with generalizable information and insights. This could be one way to react to a growing concern that economic theory has become increasingly abstract and detached from real-world problems, while policymakers may rely too much on rules of thumb that have not been tested scientifically (several contributors deal with this tension in Van Bergeijk *et al*, 1997).

4 Swedish railways – overview of changes in the regulatory framework

The Swedish deregulation process started in earnest in 1988. By that time the Swedish railway sector was more or less synonymous with Swedish State Railways (SJ), a state-owned business administration with a monopoly position on both freight and passenger rail services, protected from competition by means of laws and regulations (Table 1). Apart from being responsible for and controlling all aspects of the railway services, SJ was also involved as owner or co-owner in supporting businesses such as ferry traffic, long-distance bus services and forwarding agents. For the freight services, SJ was a contracted operator. For the passenger services, an overwhelming majority of the lines were run by SJ under its own account, that is, without the use of contracts with the state or any other authorities. For those passenger services that were unprofitable but considered important for socio-economic and political reasons, the Parliament every year granted SJ the amount of money it demanded to cover the deficits. On a limited number of passenger lines, SJ worked as the contracted operator to regional (county level) public transport authorities.

Part of market	**1988**	**2007**
Passenger services		
Regional (non-profitable)	SJ holds monopoly and receives subsidies	Procurement by competitive tendering (competition *for* the tracks)
Inter-regional (non-profitable)	SJ holds monopoly and received subsidies	Procurement by competitive tendering (competition *for* the tracks)
Inter-regional (profitable)	SJ holds monopoly	SJ holds monopoly
Freight services	SJ holds monopoly	Open access on all lines (competition on the tracks)

Table 1: Regulatory structure of the Swedish railway sector in 1988 and 2007

In the year 2007, the rail infrastructure is owned and maintained by a national authority, Banverket, also handling the train traffic control function. Public procurement by competitive tendering dominates the passenger rail market, being applied on almost all the unprofitable lines, which make up the majority of the all railway lines. SJ has been disintegrated into several specialized companies, some of which have been privatized,

while others are still state-owned. One of these, SJ AB (SJ Ltd), originating from the former passenger division, continues to be Sweden's biggest train operator. SJ AB still runs services under its own account but is also to a large extent operating under contract to regional and national transport authorities. The market for freight services is deregulated, implying open access to virtually all parts of the railway network. Green Cargo AB, the successor to SJ's freight division, still dominates this part of the market. The only part of the railway transportation market where SJ AB still holds a legal monopoly concerns the inter-regional passenger services that the company considers possible to run with a profit (that is, in principle the important lines between Stockholm and some other major cities). The company still controls most of the rolling stock but regional transport authorities and private freight operators own a considerable amount of vehicles.

In order to understand how this shift came about, we will briefly recapitulate the history of Swedish railway reforms in the next section.

5 The process of Swedish railway reforms[1]

Regulatory changes in the Swedish railway sector have often emanated from a wish to come to terms with the recurrent financial difficulties of SJ. There is an important pre-history of reforms beginning already in the 1960s, but the Transport Policy Act of 1988, with its ground-breaking split of railway infrastructure from operations, is commonly considered the starting point for the transformation of the Swedish railway system – from a vertically and horizontally integrated monopoly to a market characterized by decentralization and intra-modal competition.

The Transport Policy Act of 1988 had the objective to make the conditions for the railways more similar to those for the roads. The state took the full responsibility for railway infrastructure investments and maintenance by means of a new authority – Banverket, while SJ would transform into a train operating company, paying charges for using the tracks (based upon marginal costs for maintenance). Infrastructure investments were to be evaluated by means of socio-economic calculations. Among its several other components, the Act also marked a general policy step in the direction of extending the responsibility of the County Public Transport Authorities (CPTAs) – established in 1979 to coordinate regional public bus services – into the unprofitable regional railway services, inspired by some early cases where this had been tried. In return, the CPTAs were compensated by state subsidies equaling SJ's operating deficits on these lines and the rolling stock was also transferred to the CPTAs.

A deregulation of the railways in terms of increased intra-modal competition was not explicitly mentioned in the Act. Nevertheless, the vertical separation of infrastructure from operations, combined with the decentralized responsibility for regional railway services to regional authorities (along with the necessary money and rolling stock), made public procurement by competitive tendering of these lines possible. Some CPTAs had already tried tendering procedures for their bus services, as a result of previous reforms in that sector. This made it natural to use competitive tendering also of regional railway lines. The outcome was the first new entrant for more than 40 years, BK Tåg, in 1990.

[1] This section draws from Alexandersson *et al* (2000), Alexandersson (2002), Nilsson (1995) and Van de Velde (1999, pp.79-141).

In the beginning of 1991, the Ministry of Transport expressed the view that more operators would stimulate the railway industry to make use of its resources in a more efficient way. At the time, there was a perceived fear among many politicians that SJ's power on the transportation market could become too strong, especially since SJ's management had been unwilling to concentrate on the railway services, keeping SJ a much diversified transportation conglomerate. After a shift in power in Parliament in September the same year, a new centre-right-wing government declared its objective to open the railways to more competition. The first step was to subject more railway traffic to tendering. When SJ got rid of the responsibility for track infrastructure, it had been directed only to perform profitable train services under its own account. While large parts of the unprofitable services were run on the regional lines, therefore under the responsibility of the CPTAs, many services of the inter-regional main line network were also unprofitable. Since 1988, the state had been procuring these services by means of annual negotiations with SJ, instead of simply transferring subsidies to SJ every year to cover the deficits. In 1992, following the experiences of tendering of regional services, a regulatory change made it possible also for the state's negotiator to use competitive tendering when procuring services on the inter-regional lines.

In 1993-94 several reports looking into the feasibility of deregulating the whole network followed, coupled with a fierce political debate. In May 1994, a bill on a far-reaching deregulation was passed in Parliament, despite heavy opposition from the Social Democrats, the left-wing party and the railway unions. Consequently, when the Social Democrats regained power in Parliament through the election in September the same year, the deregulation of the railways was quickly postponed. Instead, a less radical reform was suggested, coming into effect in July 1996. The functions of allocation of track capacity and train traffic control were transferred from SJ to Banverket, while other common facilities were to be available for other train operators under commercial but non-discriminating terms. The CPTAs' rights were extended, making it easier for them to replace reductions in SJ's supply of inter-regional trains with regional CPTA-managed services. Consequently, the practice of competitive tendering became available for more parts of the railway network. For the freight services, open access on the whole network was introduced, based upon the belief that these services would stand better chances against other modes of transportation if they were forced to adapt to what the market wanted. Actual access to capacity was only limited by a "Grandfather's right" clause, giving an operator the right of precedence to a timetable position it had used before. In practice, this rule was rarely (if ever) enforced and was eventually abandoned in 2004.

A new Transport Policy Bill was passed in 1998. In an effort to achieve more equal terms for competing modes of transportation, in particular concerning freight, the track access fees were lowered. In order to make entry easier for freight operators competing with SJ, some fringe railway lines that had remained in SJ's hands were transferred to Banverket. Moreover, a new national authority, Rikstrafiken, was established. The authority took over the tasks of the former state's negotiator, becoming responsible for competitive tendering of unprofitable inter-regional services (including all modes of public transportation), aiming also at better co-ordination with the CPTA-tendered services. Following the inflow of new operators in 2000, a new Bill had the objective to facilitate for SJ to compete under the new circumstances and to ensure equal access to functions and services for all operators. SJ's organizational structure as a business administration was therefore replaced in 2001 by several state-owned companies concentrating on specified

parts of the railway businesses. The passenger division formed one company (SJ Ltd), the freight division another (Green Cargo), and so on for real estate (Jernhusen), maintenance (EuroMaint) and other businesses. Two divisions, TraffiCare (cleaning services) and Unigrid (computer information systems), were fully privatized a few months later. EuroMaint and SweMaint were initially also set to be privatized rather quickly but this process was not completed until 2007. All this is summarized in Figure 1, also including some of the previous divestments and separations from the business administration SJ. In the figure, firms and organizations presented in red boxes are still state-owned, while the companies in green boxes are now in the private sector.

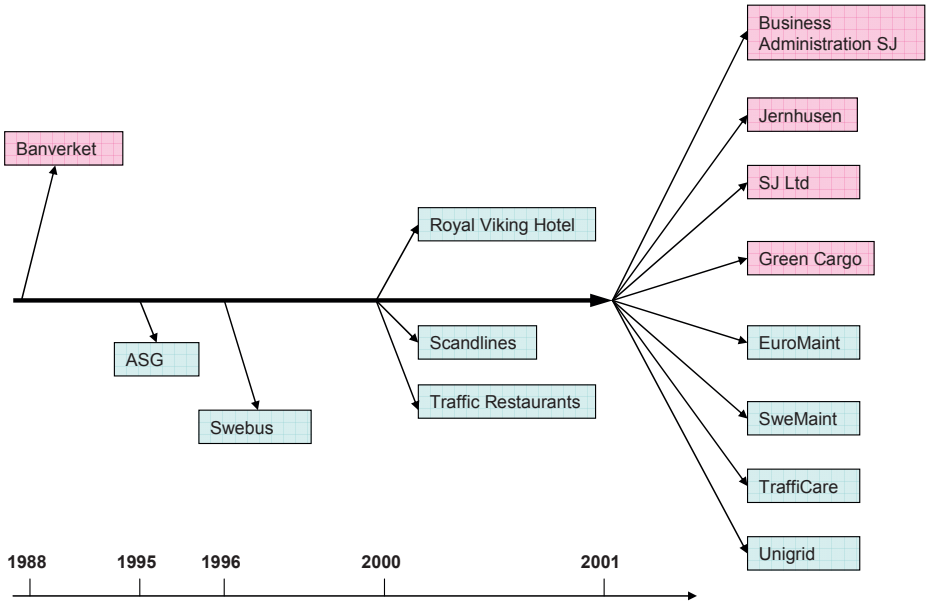

Figure 1: The separation of the business administration SJ 1988-2001

Since the Bill of 2000, the process of regulatory change in the Swedish railway sector has to some extent slowed down. On several occasions, it has been suggested that the remaining monopoly of SJ Ltd concerning the profitable inter-regional lines should be abolished, possibly opening up for open access or at least competitive tendering on these lines. The Social Democrat government (in power until late 2006) was unwilling to take this step, motivated by a perceived need for more time to evaluate the effects of the already implemented reforms. In 2003, the state had to interfere by means of transferring a large amount of money (1.8 billion SEK) to SJ Ltd from other state-owned companies in order to avoid bankruptcy (Proposition (2002/03:86). It had then become clear that the breaking-up of SJ into several separate companies had been an under-financed reform but also that several of SJ's contracts for regional and inter-regional passenger services were highly unprofitable due to the fact that SJ had won the tendered contracts with too low bids.

The most recent reforms have focused on modernizing laws and regulations to achieve a regulatory framework in line with European Union directives. Following the European

Commission's first railway package, a new railway law and railway regulation came into effect in July 2004, and a new Swedish Rail Agency was established (SFS 2004:519, SFS 2004:526). During 2005-2006, a new transport policy bill was in preparation. One important issue was how Sweden should prepare for a future decision on the European Commission's third railway package and the opening up of international passenger railway services between member states from 2010. In the end, a "wait-and-see"-approach was chosen, keeping most of the regulatory framework unchanged. The new center-right-wing government (established after the Parliament election in 2006) looks set to once again look into the prospects for a continued deregulation.

6 The Swedish railway system – actors and roles

The current framework of the Swedish railway market implies that the national authority Banverket owns and maintains the state's railway infrastructure. Since this amounts to about 80% of all railway lines, Banverket is the primary rail infrastructure holder (Banverket, 2004). Regional authorities own a couple of lines, mainly in the Stockholm region. In addition to this, several minor fringe lines are owned by factories and municipalities. Banverket gets its financial resources mostly from national grants, decided by Parliament for multiple-year-periods but also handles the track access charges paid by operators for using the tracks. The Government and Parliament have given Banverket the overall responsibility for the development of the railway sector. This sector responsibility comprises railway transportation, as well as tram and underground transportation.

The Train Traffic Control unit within Banverket monitors all train movements on the Swedish railway network. The organization is also responsible for offering the operators good opportunities to run their trains. All the wishes of the operators are coordinated with the objective to find solutions that meet these wishes in the best possible and non-discriminatory way. Due to track capacity constraints on a large part of the network, Banverket actually allocates planned delays compared to the shortest possible time needed for a particular transportation. The end result of this process is the granting of certain timetable positions ("slots") to each operator, and the production of a corresponding national timetable.

All in all, there are about 500 railway stations where trains stop for passengers. Many of these are very simple stops (controlled by Banverket), with no special buildings or facilities for passengers. Many stations (with or without passenger facilities) are owned and maintained by regional authorities, being used only for local and regional services. About 170 stations are equipped with station buildings on separate estates. 150 of these are owned by Jernhusen, the state-owned company formed out of SJ's old real estate division. In addition to this, there are a large number of terminals and facilities used primarily for freight services, owned by several different actors. Jernhusen is the primary owner of buildings used for maintenance of rolling stock.

One key authority is the newly established Swedish Rail Agency. Formed out of the old Railway Inspectorate, the authority has taken over the tasks concerning safety in the railway, underground and tram systems. It has also been assigned new tasks, such as monitoring that the fees charged for the utilization of the railway infrastructure are determined in a competition-neutral and non-discriminatory manner. The same goes for

capacity allocation and provision of services. Any operator wishing to operate train services on the Swedish rail network needs to apply for a license from the Rail Agency.

The CPTAs are important players in the market, since they account for much of the procurement of railway services. Generally, they also provide their contracted operators with the necessary rolling stock for these services. Together, some of the CPTAs own a rolling stock company, Transitio, thereby managing a large part of the fleet of regional passenger trains. Firms competing for inter-regional services procured by Rikstrafiken may hire vehicles from the company ASJ (the remains of the business administration SJ), where the leasing contracts of the rolling stock are being handled. SJ Ltd and Green Cargo also hire leased vehicles from ASJ. Consequently, ASJ in several respects functions as a rolling stock company today. Freight operators generally have to get their own rolling stock. Perhaps with the exception of locomotive power, the market for freight vehicles is comparably well developed. The vehicles are more standardized than the rolling stock for passenger trains and independent private owners have been around for quite some time.

Several other companies provide various supporting functions to the operators and other organizations. Some of these came out of the corporatization of SJ, others were divested earlier and yet others are new entrants not originating from SJ. One of the most important companies of the first category is EuroMaint (recently privatized and owned by Ratos), the dominant company for maintenance of railway vehicles. Another actor in maintenance is SweMaint (recently acquired from the state by Kockums Industrier), primarily working with freight vehicles. TraffiCare (owned by ISS) provides terminal services such as cleaning (previously also switching). The former Unigrid (now a part of Cap Gemini Ernst & Young and Norwegian EDB Teamco) is active in IT services. Like EuroMaint and SweMaint, TraffiCare and Unigrid also stem from the corporatization of SJ.

Currently, about 20 train operating companies use the Swedish state's rail infrastructure, most of them being very small. On the passenger side, the state-owned company *SJ Ltd* is still the dominant operator. *Green Cargo*, formed out of the former freight division of SJ, is the largest rail freight operator.

The basic model of competition in the market for passenger services is competition "for the tracks". Once a contract has been won in a tender, the winning firm becomes the sole provider of the specified services during the contract period. There are two main types of contracts in use. For the CPTA-managed services, gross-cost contracts are dominant. The operators bid for the lowest amount of subsidy needed to cover the costs (including a profit) of operating the services. The CPTAs are responsible for planning and marketing of the services and generally take all the revenues from ticket fares during the contract period. The other type of contract is the net-cost contract, generally used by Rikstrafiken for the contracts of inter-regional services. The bidding firm has to project both the costs and the revenues from fares during the contract period, bidding for the minimum amount of subsidy needed to cover the deficit. During the contract period, the operator sells tickets and collects fares, and generally has more freedom to influence the services than under a gross-cost contract. Turning to the freight services, the primarily model in use is one of "open access" or competition "on the tracks".

As should be apparent from above, the State is still a very important actor in the Swedish railway sector and has a number of roles related to railway and transportation policy issues. The state is the owner of SJ Ltd, Green Cargo, Jernhusen, and other companies (and until very recently also controlled EuroMaint and SweMaint), with all the

responsibilities following from ownership. The state is also responsible for investments and maintenance in railway infrastructure through Banverket and for auditing, safety and regulatory issues through the Rail Agency. The role as owner also has to be combined with the role as the entity responsible for setting up the basic conditions for competition and running firms in society, in this case, the rules of the game in the railway market. In addition to this comes the role of forming the long-term national transport policy. It is a delicate problem for the state to carry out all these roles simultaneously without causing conflicts.

7 Analyzing the reforms – key facts and figures

7.1 Competition and entry

Competition has gradually been introduced and spread in the Swedish railway markets. BK Tåg became the pioneering first new regional passenger train operating company in 1990, but it wasn't until 1995 that another operator entered this part of the market. In the market for inter-regional services, despite being tendered since 1992, the break-through for competing operators did not happen until the year 2000. Turning to the freight services, the first new entrants appeared in the early 1990s. Generally, these were minor freight operators working as sub-contractors to SJ. In 1993, the state-owned ore company LKAB became the first company to get its own operating license on the state's railways, thereby being able to take control of its own transportation needs.

As has been mentioned above, about 20 train operating companies use the Swedish state's rail infrastructure, although most of them are very small. *SJ Ltd* is still the dominant operator of passenger trains, but firms like *Connex*, *Arriva* and *Tågkompaniet* (owned by NSB) are important competitors. In terms of passenger kilometers, SJ Ltd had a 74% share of all railway services in 2004, with an 88% share of the long-distance (more than 100 kilometers) and a 54% share of the short-distance (less than 100 kilometers) railway services (Banverket, 2005a). These differences reflect the fact that substantial parts of the inter-regional services are affected by SJ Ltd's remaining monopoly rights, while most of the short-distance services have now been tendered at least once. Taken together, the shares of the four largest firms amount to about 95%. *Green Cargo*, the largest rail freight operator, has a 74% market share in rail freight transportation in 2004 (Banverket, 2005a). MTAB is the second largest operator, carrying out the transportation of ore on the Iron Ore Line. Being a subsidiary to the mining company LKAB, it is state-owned too. TGOJ is another important freight operator, but this company is a subsidiary to Green Cargo. Although there are several minor private freight operators, only a few, like BK Tåg's surviving freight division and newcomer Hector Rail actually compete with Green Cargo and TGOJ for the same contracts. It is clear that the buyers of transportation services, that is, the manufacturing firms, have been rather slow to make use of the new competitive market. When they have used it, it has often been aimed at making Green Cargo lower its prices, rather than actually switching to another operator.

In addition to looking at the number of new entrants, it is worthwhile to consider the number of active bidders over time (in the tenders for passenger services). Data from 91 tenders between 1989 and 2005 show that rather few bidders have been active in each tender (Alexandersson and Hultén, 2006). On average, the CPTAs' tenders have attracted

more bidders (2-3) than the state's tenders (1-2). In recent tenders, the number of bidders has increased. Another observation is that it has generally been difficult for firms to win tenders for a specific line or traffic system twice in a row. Similar results have been presented regarding Great Britain (Nash & Smith, 2006).

The market for maintenance of passenger vehicles provides us with an interesting example of the development of competition in the supporting industries. The former maintenance unit within SJ, EuroMaint, now has a share of slightly less than 50 percent in this market. Important competitors are operators that combine their traffic operations with maintenance services and train manufacturers like Bombardier and Alstom. Alstom is a new actor in Sweden, being established after having won tenders for delivery of new trains. Several foreign companies are preparing for offering maintenance services on the Swedish market. Among these one should mention Mantena (subsidiary to NSB), the technical division of DSB (primarily interested in strengthening its position in the Swedish part of the Öresund region), and DB, that have expressed strong intentions to establish itself in Sweden.

7.2 Subsidy effects

Typically, there have been subsidy reductions in the magnitude of 20% in the first round of the CPTAs' tenders (Table 2). For the services procured by the state, substantial reductions were accomplished during the first two years of tendering, despite the lack of actual new entry. After that a period of tenders implying stable subsidies followed. When several new firms finally were able to win these tenders in 1999, additional large subsidy reductions (28%) were achieved.

7.3 Infrastructure spending and costs

Since vertical separation in 1988, there has been a substantial surge in public spending on infrastructure investments and renewal. Actually, it is highly probable that the split was absolutely necessary for this development to take place. Prior to separation, SJ suffered from trying to perform services on a network that was under-capitalized. Once a line started to make losses, infrastructure investments typically came to a halt. For the state, it was difficult to grant more money to SJ, partly because it could be seen as unfair from the view of other transportation companies, and partly because it was difficult to monitor how SJ actually spent the money. Setting up the national authority Banverket made it much easier to increase public spending on the railways, since all the money was channeled to a national authority rather than to a specific operator in the transportation industry. The split included an agreement implying that the state committed itself to spending at least one billion SEK per year on infrastructure investments while SJ would concentrate on becoming an efficient railway operator. During the recession of the early 1990s, public spending on infrastructure investments increased to about three billion SEK per year. Environmental concerns and political objectives of achieving sustainable development have made it possible for this trend to continue, and for the years to come investments of approximately 10 billion SEK per year are forecasted.

Lines procured by CPTAs (regional lines)	Tender No.	Year	Subsidy effect
Network in county of Jönköping etc	1	1989	-21%
	2	1993	-25%
	3	1997	Minor increase
Ystad-Simrishamn	1	1995	-18%
	2	1998	-10%
Herrljunga-Hallsberg	1	1994	-10%
	2	1999	-3%
	3	2002	Minor increase
Borlänge-Malung	1	1991	n.a.
	2	1994	-20%
	3	1996	Minor
Uppsala-Tierp	1	1991	n.a.
	2	1999	-20%
Stockholm, commuter trains	1	1998	-32%
	2	2005	+10%
Lines procured by the state (interregional lines)	**Tender No.**	**Year**	**Subsidy effect**
All lines	1-2	1992-93	-21%
	3-6	1994-98	No increase
	7	1999	-28%
Northern trains	7	1999	-20%
	10	2002	-42%

Table 2: Examples of subsidy effects from competitive tenders

Source: Press releases and other documentation from the CPTAs and Rikstrafiken.

The investments have resulted in new lines and tracks upgraded for higher speed and increased safety. However, it is a bit worrying that regional development policies to such an extent have come to influence where public spending on infrastructure is made. Much money is directed to large-scale infrastructure projects (like the new Botnia Link), without any guarantee that the operators will actually be able and willing to run commercial services on these new lines in the future.

The main principle behind the track access charges is that they should amount to the incurred marginal costs of Banverket in terms of track operation and maintenance. In 2004, the total income from track charges amounted to 426 million SEK, corresponding to 11% of Banverket's total funds directed to operation and maintenance (Banverket, 2005b).

7.4 Travelling and transportation volumes

The transportation volumes (in terms of passenger kilometers) have increased by more than 40% between 1990 and 2003. Looking closer at the development since 1995, it is clear that no other mode has experienced a stronger growth in terms of passenger kilometers. Behind an increase of 32%, we find that the growth in short-distance regional transportation has been particularly strong (up more than 70%), while long-distance

traveling (more than 100 km) increased by 15% (SIKA, 2005). For the freight sector, transportation (measured as ton kilometers) went up by 5% between 1990 and 2003.

7.5 Employment and profitability

All in all, the railway companies and their supporting organizations employed almost 19.000 people in 2003. In comparison, the corresponding businesses had about 34.000 employees in 1987, when they were still parts of SJ. Since the transportation volumes have increased substantially during this period, labor productivity (for those directly involved in traffic operations) increased from five to nine train kilometers per employee between 1990 and 1999 (SOU 2005:4).

Many operators have suffered from low profitability, and numerous small operators have filed for bankruptcy. However, in 2005, a dramatic turn towards profitability became evident for most of the major players: SJ Ltd, Green Cargo and EuroMaint.

7.6 Ticket prices

Banverket has investigated the development of ticket prices during the period of 1988-2003 (Table 3). From this, it is evident that prices have increased substantially more than the Consumer Price Index. Some of this increase may be explained by the introduction of VAT in 1991 but more important is the introduction of a more differentiated price structure as the X2000 high speed trains replaced many cheaper InterCity trains. For the regional services, it seems as if the CPTAs have rather increased ticket prices than the level of subsidization through taxes. Although the prices have increased, it may also be argued that passengers are getting improved services. In view of how traveling by train has developed (as presented above), it appears as if people have actually been willing to pay for this. However, the relative cost of using other modes of transportation may also be an explaining factor.

	Change 1988-2003
Ticket prices (current prices)	+125%
Consumer Price Index	+57%
Ticket prices (adjusted for inflation)	+43%
Value Added Tax (VAT)*	+6%
Price excluding VAT (operator revenue)	+35%
Ticket price adj for inflation: *X2000*	+53%
Ticket price adj for inflation: *regional trains*	+59%
Ticket price adj for inflation: *InterCity/night trains*	+24%

Table 3: Development of ticket prices 1988-2003

Note: * VAT on traveling changed several times during the period. Before 1991 it was 0%. In 1991 it was introduced at 25%, to be lowered to 18% in 1992 and 12% in 1993 (after a temporary rise to 21%). Since 1999 it has been stable at 6%.

Source: Banverket (2005a).

8 Conclusions

The Swedish deregulation of railway services started off as a process of reforms without any clear intentions to introduce competition or increasing the involvement of private actors, neither national nor international. Nevertheless, this was what the path came to lead to. The driving forces of the development have been SJ's recurrent problems, coupled with political objectives to save railway lines from closure, improve sector efficiency, increase railway travel and transfer freight transportation from the roads to the railways. In relative terms, there has been much more focus in Sweden on inter-modal competition than on intra-modal competition, especially when compared to the objectives on the EU level. The major reforms in the late 1980s and early 1990s were also by and large initiated independently of any European railway policies (Sweden joined the European Union in 1995). Actually, only the very recent reforms have occurred as direct consequences of EU directives and regulations. During the last seven years, the Swedish railway sector has moved much closer to privatization and internationalization. The institutional framework – regulatory agencies, ownership of firms, norms, and vertical disintegration of the value chain – has in nearly all aspects changed to such an extent that a complete deregulation is now possible. The one resource that perhaps more than any other has been debated during the Swedish deregulation process is the rolling stock and the access to suitable vehicles for other actors than SJ. During the process of deregulation, these problems have at least partially being solved. For the regionally tendered services, the CPTAs provide the operators with the necessary rolling stock, either by themselves or via their rolling stock company Transitio. Rikstrafiken may (via ASJ) provide vehicles to operators of tendered inter-regional services.

The Swedish railway market is not totally open for competition. State-owned SJ Ltd has a share of nearly 75% of the market for passenger train services, partly protected by the exclusive right to run those inter-regional lines that do not require operational subsidies. The four biggest firms have about 95% of this market. Two state-owned firms still dominate the open-entry freight market: Green Cargo and MTAB. In reality, MTAB is a monopolist on the iron ore line in northern Sweden and Norway.

Following the stepwise vertical and horizontal disintegration of SJ, barriers to entry are low but passenger train operating companies face uncertainty about their survival due to the repeated tendering. Data from both Great Britain and Sweden show that firms have problems winning tenders for the same traffic two times in a row. Transaction costs have been of some importance in the creation of organizations performing the competitive tenders and regarding some litigation costs after tenders. In practice, the number of present operators and the low barriers to entry suggest that the competitive tenders have been workable competitive despite relatively few bidders taking part in the average tender. However, in a long-term perspective, a persistent low number of bidders may create opportunities for strategic bidding by dominant firms (Alexandersson and Hultén, 2006). It is therefore a promising sign that the number of bidders has increased during the last year. The competitive tenders of passenger services have resulted in reductions in operational subsidies in the magnitude of 20%. Services threatened by closure have thereby often been possible to keep or even develop without additional costs. In the freight sector, the transportation buyers have been able to gain from reduced costs of transportation due to competition. Several of the new and minor freight operators have succeeded in developing new business concepts, thereby shifting freight from the roads to the railways.

The decentralization of responsibility for the unprofitable regional lines placed responsibility among the actors most committed to continuing and developing these lines. The result has commonly been a revival of the services and better co-ordination with local and regional bus services. In some cases though, it is likely that some rail services have been saved that – from a socio-economic and even an environmental point of view – should rather have been replaced by bus services. The restructuring of the Swedish railway sector coincides with several improvements in measurable figures, although the cause-and-effect relationships are not always clear. The transportation volumes have increased substantially, in particular regarding the passenger services. Since the number of employees in the sector has simultaneously decreased, labor productivity has also increased.

It is quite possible that the disintegration of the railway network and the increased competition from new train operators have resulted in some sub-optimization and loss of scale economies. However, it is also clear that the former monopoly did not have strong enough incentives to rationalize and exploit economies of scale. The reorganization of the railways and the tendering system has put the focus on operational cost efficiency.

In several respects, the reforms have improved the Swedish railway system but the deregulation has also been very costly for the taxpayers. It is clear that the many incremental steps have resulted in a situation with several competing models for how the railway services should be handled and organized: a) with SJ as a monopolist on profitable lines specified by SJ, b) with open access for freight operators (to some extent limited by already established services), c) under national tendered contracts where the operator bears the revenue risk (net cost contracts), d) under regional tendered contracts where the CPTAs bear the revenue risk (gross cost contracts), e) under contracts between SJ and CPTAs that have not been tendered, and f) with private monopoly firms on commercially attractive lines such as the Arlanda Airport Link. Consequently, despite more than fifteen years of deregulation and liberalization, and tens of billions of Swedish crowns in subsidies, the Swedish railway sector continues to be in search of a unified stable regulatory structure.

The Swedish deregulation process has advanced in an incremental manner, with periods of relative calm following more or less radical reforms. The regulatory structure has now remained virtually unchanged for more than five years. There seem to be no immediate need for reform: most operators and suppliers are profitable, new firms show willingness to enter the market, the key firms are profitable, the freight and passenger markets are growing, the number of bidders in the competitive tenders are moving slightly upwards and more and more regional networks are put out to tender. Therefore, it is probable that the current state of the deregulated Swedish railway system is more sustainable than at the earlier pauses in railway reform (1989-1991, 1993-1995 and 1997-2000).

Nevertheless, the regulators will sooner or later have to deal with some inconsistent features of the Swedish regulatory framework. In the long run, it is not feasible to keep SJ Ltd's exclusive right to run commercially passenger services without any obligations linked to this privilege. Currently, SJ may for example change these services at will, basically without any obligation regarding the overall level of supply, the stations used, the ticket prices or the coordination with adjacent services run by other operators. Another problem is the expansion of the subsidized part of the network, and in particular the CPTA-managed lines. In order to meet customer demand and also offset the unreliable long-term supply of SJ Ltd, several CPTAs seek to expand and coordinate their services

into larger networks. This highlights the need to clarify the interface between commercial and subsidized lines and which of these that should take precedence.

Once among the pioneers of railway reforms, further steps in Sweden are now much more influenced by agreements upon common EU policies. The development on the EU level is not pointing in a single direction. The goal to continue the liberalization of European railways, characterizing the three railway packages, does not seem entirely compatible with the recent work on a new regulation for public service contracts, where the preservation of most national practices and even protectionism appears legitimate. In this state of confusion, it may prove wise for Sweden to go ahead with further reforms, primarily for the development of competencies and companies that are now no longer integrated parts of the national railway operator. Once deregulation in Europe moves on, these firms will benefit from having had the chance to adapt early to more market-like conditions.

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Essay 4

Rail Privatization and Competitive Tendering in Europe

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Rail Privatization and Competitive Tendering in Europe

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During the past two decades the European railway sector has experienced a number of changes and reforms aimed at increasing competition and private sector involvement. Sweden's vertical separation of infrastructure from operations in 1988 was an early initiative, also influencing EU-wide policies demanding separate accounts or full separation. In the mid 1990s Great Britain transformed its entire railway industry by means of privatization and franchising. No other EU country has gone this far in terms of rail privatization, but franchising and competitive tendering of passenger rail services have become important elements in several other countries. In the wake of this development, we have seen an increase of both new and old operators becoming international players. In this article, these reforms are studied and discussed in some detail, drawing from the experience of franchising and competitive tendering in several European countries. The theoretical rationale as well as other reasons behind privatization and competitive tendering are discussed. The article also includes some overall conclusions regarding the (positive and negative) effects of the reforms.

Twenty years ago, Sweden's vertical separation of railway infrastructure from train operations became something of a starting point for a railway reform process that eventually came to influence most of the European railway industry. Important elements of this reform process include separation and divestment – not only of infrastructure but several other functions as well as horizontal services, the introduction of intra-modal competition by means of tendering and other procedures, and sometimes partial privatization of railway industry firms or business activities.

The aim of this paper is to present an overview of this development and the current status of privatization and competitive tendering in Europe, with the primary focus on passenger rail services. To this end, the theoretical and practical background is initially briefly described, followed by an outline of the main reforms undertaken in the countries of Sweden, Great Britain, Germany and the Netherlands. Drawing from the experience of these countries, some conclusions on the overall development are made. The paper ends with an outlook for the future.

Reforms in the Railway Sector: Theoretical and Empirical Background and Concepts

During the past 30 to 40 years, the views on regulations and intervention from the state have changed considerably. The main argument for regulations is that they are sometimes necessary to avoid the problem of *market failures* in certain industries. However, towards the end of the 1960s and in the early 1970s, the view that regulations are important to protect common interests became the target of increasingly fierce criticism. Stigler

(1971) and Peltzman (1976) developed models showing that government intervention in some cases could be more harmful than actual market failures. As an opposite pole to market failures, the concept *regulatory failures* was coined. Regulations could hinder innovation and progress. One key argument was that regulators could become 'captured' by those they were aimed to control. In other words, firms already present in an industry might be able to manipulate regulations in order to gain advantages.

Following the theoretical development, a wave of regulatory reforms aimed at deregulation, increased competition and private sector involvement was initiated in the early 1970s, affecting the US, Europe as well as other countries. The transportation sector, often subject to strict regulations, public ownership and subsidies, and commonly viewed as inefficient, became an early target for these reforms, including the deregulation of the US airline industry in the 1970s, the Stagger's Act deregulation of US railroads in 1980 and the deregulation of UK long-distance bus services the same year.

In the railway industry, presupposed scale economies in production, marketing, purchasing and coordination, for a long time implied that the provision of vertically integrated railway services was by definition viewed as a 'natural' monopoly (see, for example, Beesley and Littlechild, 1992). In line with this, most European countries had come to organize their railway networks in national and vertically integrated monopolies. Although the importance of scale economies is still debated in the railway industry, it is today primarily the rail infrastructure that continues to be viewed as having characteristics of being a natural monopoly. This changed view has formed the basis for vertical separation of infrastructure from operations as applied in several European countries. In most countries, this has also been a necessary pre-requisite to introduce more competition in railway-related services.

The reforms in the European transportation markets have typically involved the introduction of public procurement of bus and railway services by means of competitive tendering, also known as a franchise bidding framework (as originally developed by Chadwick in the 1850s, followed by Demsetz (1968), as an alternative to regulation of natural monopolies). In a competitive tender, a firm or a consortium may make promises about supplying a service at a defined quality level for either a subsidy or against a payment. Using competitive tendering when contracting out a public service is similar to performing an auction with a sealed-bidding procedure. The price of the bidders may not be the only factor (although often the most important one) to take into account. The procuring public authority typically evaluates the competing bids regarding both price and quality once the bidding process has ended.

Competitive tendering of railway services is sometimes also referred to as competition 'for the market' or 'for the track' since the tendering procedure leads to a temporary monopoly to operate a certain line once the bidding process is over. An alternative is competition 'on the track', which implies an *open access* approach, in which several operators may apply for the right to use the same tracks as long as capacity allows it. In Europe, this option is primarily used for the more deregulated freight services, although there are examples also of on-the-track competition in passenger rail services.

Common EU transportation policies have increasingly affected the development of railway organization and operations in the EU Member States. The European Directive 91/440 on the separation of accounts for infrastructure from operations has commonly functioned as a starting point for railway reforms (Holvad, 2009, this issue). Likewise, public procurement by competitive tendering has been endorsed as a way to increase competition, save taxpayers' money and safeguard equal treatment for competing firms, regardless of nationality (see for example European Commission, 1996).

An overview and interpretation of how far railway reforms and market opening have actually progressed in the countries of the European Union is provided in reports of the so-called rail liberalization index (Kirchner, 2007). Looking at both the use of competitive tendering and other means of access for new entrants, table 1 below summarizes the situation in Europe. While several countries have started to use competitive tendering of rail services (and some have practised it for several years), direct negotiations with (typically) only one rail operator (involving no tendering procedure) still plays an important role.

A relevant question to ask is why certain European countries have chosen to introduce competitive tendering and sometimes also other reforms in order to transform their railways markets, while other countries have not taken the same path and some are even lagging behind in the implementation of reforms decided at EU level. It is beyond the scope of this paper to answer this question thoroughly, but a tentative answer may be that countries have followed different political agendas and industrial policies rather than simply looking at economics. As follows from the country cases in the next section, a certain amount of urgency or even situations of crises may have facilitated the development and implementation of reforms in the railway sector.

Four Country Cases[1]

Although the railway reforms in European countries to some extent can be explained and understood by common factors – as presented in the section above – it is important also to consider the national context. For that purpose, we will now take a closer look at four European countries all of which are considered to have progressed far in terms of railway reforms: Sweden, Great Britain, Germany and the Netherlands. Looking only at this set of countries – with similar ambitions towards reforms – naturally has its limitations, and may for example fail to consider important lines of development in other countries. Nevertheless, these cases do serve as valuable sources of experience on railway reforms aimed at privatization and the use of competitive tendering, ultimately influencing the development in other countries as well as having an impact upon common EU policies.

Sweden

Regulatory changes in the Swedish railway sector have often emanated from a wish to come to terms with the recurrent financial difficulties of Swedish State Railways (SJ). The Transport Policy Act of 1988, with its split of railway infrastructure from operations, is commonly considered the starting point for the transformation of the Swedish railway system, from a vertically and horizontally integrated monopoly to a market characterized by decentralization and intra-modal competition.

The Act had the objective of making the conditions for the railways more similar to those for the roads. The state took the full responsibility for railway infrastructure investments and maintenance by means of a new authority – Banverket – while SJ would be transformed into a train operating company, paying charges for using the tracks (based upon marginal costs for maintenance).

A deregulation of the railways in terms of increased intra-modal competition was not explicitly mentioned in the Act. Nevertheless, the vertical separation of infrastructure from operations, combined also with the reform to decentralize responsibility for regional railway services to the County Public Transport Authorities – CPTAs – along with the necessary money and rolling stock, made public procurement by competitive tendering of these lines possible. The outcome of one of the very first tenders of regional railway lines was a new entrant, BK Tåg, in 1990.

In 1991 a new centre-right government

Table 1. Overview of market opening in the European railway sector.

Country	*Formal Award Procedure for Public Service Contracts*	*Access: Commercial Passenger Services*	*Access: Freight Services*	*External Passenger Operators*		*External Freight Operators*		*Comments*
				Number	*Share (of pass. km)*	*Number*	*Share (of tonne km)*	
Austria	Direct negotiation and competitive tendering	Open access for domestic operators (some restrictions for foreign)	Open access	Several state-owned +1 additional	Public service: 10%	10	7.7%	Only one case of tendering; external rail passenger operators provide transport on their own networks.
Belgium	Direct negotiation	Open access (domestic companies only)	Open access	None	0%	3	N.a.	
Bulgaria	Direct negotiation	Open access	Open access	None	0%	2	3%	No purely commercial services exist; State-regulated ticket prices make commercial services uninteresting for external companies.
Czech Republic	Direct negotiation and competitive tendering	Open access (domestic companies only)	Open access	See comments	See comments	See comments	See comments	19 external railway undertakings exist but their combined market share is marginal.
Denmark	Direct negotiation and competitive tendering	Open access for domestic operators (some restrictions for foreign)	Open access	2	3.4%	2	100%	25% of public service contracts tendered; purely commercial passenger services possible but non-existent; freight is dominated by Railion Denmark, with the runner-up having 5% market share.
Estonia	Competitive tendering	Open access	Open access	N.a.	Public service: 40% Commercial: 100%	N.a.	30%	Private rail monopoly including infrastructure (established in 2001) was renationalized in 2007; Purely commercial services would have to compete with network-wide public service contract services.
Finland	Direct negotiation	No access for external operators	Open access (with some restrictions for foreign operators)	None	0%	None	0%	
France	Direct negotiation	No access for external operators	Open access	None	0%	2	0.5%	
Germany	Direct and public negotiation and competitive tendering	Open access for domestic operators (some restrictions for foreign)	Open access	Short distance: 50 Long-distance: 3	Short-distance: 15% Long-distance: <1% Overall: 7%	ca 280 (of which 8 dominate)	16%	12% of the volume of public services contracts awarded through tendering procedures; More than 330 external operators in total.
Great Britain	Competitive tendering	Open access	Open access	33	100%	9	100%	All franchises subjected to tendering.
Greece	Direct negotiation	No access for external operators	Open access	None	0%	None	0%	No external operators have applied for access to the Greek rail network.
Hungary	Direct negotiation	Open access for domestic operators (some restrictions for foreign)	Open access	None	0%	4	5%	
Ireland	Direct negotiation	No access for external operators	Open access	None	0%	None	0%	

Italy	Direct negotiation and competitive tendering	Open access for domestic operators (some restrictions for foreign)	Open access (with some restrictions for foreign operators)	6	<1%	10	8%	Only 2.5% of passenger public service contract awarded without exclusivity to incumbent. The market share of external passenger operators is only marginal.
Latvia	Direct negotiation and competitive tendering	Open access (restrictions for foreign)	Open access	None	0%	4	10%	Tendering to start in 2008. Purely commercial services would have to compete with network-wide public service contract services
Lithuania	Direct negotiation and competitive tendering	Open access	Open access (with some restrictions for foreign operators)	None	0%	None	0%	Purely commercial services would have to compete with network-wide public service contract services.
Luxembourg	Direct negotiation	Open access for domestic operators (some restrictions for foreign)	Open access	None	0%	None	0%	Purely commercial national transport does not exist.
Netherlands	Direct and public negotiation and competitive tendering	National services closed for new entry until 2015.	Open access	Short distance: 3	N.a.	9	25%	Towards increased tendering of regional traffic. Had been used for 6% of services (in 2005)
Norway	Direct negotiation and competitive tendering	Open access only on disused lines (with additional restrictions for foreign companies)	Open access	1	N.a.	2	N.a.	Only one tender performed (put to service in 2005).
Poland	Direct negotiation and competitive tendering	Open access for domestic operators (some restrictions for foreign)	Open access	10	10%	29	23%	
Portugal	Direct negotiation and competitive tendering	Limited open access (international groupings)	Open access (with some restrictions for foreign operators)	1	N.a.	None	0%	Only one actual tender performed (in 1999).
Romania	Competitive tendering	Open access for domestic operators (some restrictions for foreign)	Open access	3	1.2%	23	26%	Purely commercial services exist only on non-interoperable lines (25% of network).
Slovakia	Direct negotiation	Open access for domestic operators (some restrictions for foreign)	Open access	None	0%	27	3%	Single external passenger operator discontinued operations in 2005.
Slovenia	Direct negotiation	Open access only to cross-border services for foreign companies	Open access (with some restrictions for foreign comp)	None	0%	None	0%	National public service market closed until 2010.
Spain	Direct negotiation	No access for external operators	Open access (with some restrictions for foreign operators)	None	0%	2	<1%	External freight operators have only marginal market shares.
Sweden	Competitive tendering	Open access for night trains and chartered trains only	Open access (with some restrictions for foreign operators)	8	Public service: 55% Commercial: 10%	11	35%	All public service train operations tendered. One commercial line (Arlanda airport link) tendered as BOT contract.
Switzerland	Direct negotiation	Limited open access (only for irregular special services)	Open access	17	N.a.	5	25%	Only 2 cantons used tendering - none since 1996; External passenger operators have historic franchises.

Sources: CER (2005) and Kirchner (2007).

declared its objective to open the railways to more competition. The first step was to subject more railway traffic to tendering, introducing it also for the unprofitable parts of the inter-regional main line network in 1992. In 1994, an Act on a far-reaching deregulation was passed in Parliament, but when the Social Democrats regained power later the same year, the deregulation of the railways was quickly postponed. Instead, a less radical reform came into effect in 1996. The functions of allocation of track capacity and train traffic control were transferred from SJ to Banverket, while other common facilities were to be available for other train operators under commercial but non-discriminatory terms. For the freight services, open access on the whole network was introduced.

In 1998, a new national authority, Rikstrafiken, became responsible for competitive tendering of unprofitable inter-regional services (including all modes of public transportation). Following the inflow of several new operators in 2000, a new Act had the objective of facilitating SJ to compete under the new circumstances. SJ's organizational structure as an administrative business was therefore replaced in 2001 by several state-owned companies concentrating on specified parts of the railway businesses. The passenger division formed one company (SJ Ltd), the freight division another (Green Cargo), and so on for real estate, maintenance and other businesses. Two divisions, comprising cleaning services and computer information systems, respectively, were fully privatized at an early stage, while privatization of the maintenance companies followed in 2007.

Since the 2000 Act, it has often been suggested that the remaining monopoly of SJ Ltd concerning the few profitable inter-regional lines should be abolished, possibly opening up for at least competitive tendering on these lines. In 2006, the Social Democrat government decided to open up all lines for charter and night train services. The current centre-right government has clearly stated that it intends to go on with railway deregulation and market opening and has also made it possible for some CPTAs to include larger networks in the tendering procedures.

Experience and Effects. The introduction of competitive tendering of regional passenger railway lines immediately led to the entry of BK Tåg in 1990, but for a couple of years this remained the only new entrant and true competitor to SJ. It was not until 1995 that another small operator entered this part of the market. In the market for inter-regional services, the breakthrough for competing operators did not happen until 2000, after transparency had gradually been improved as more and more functions and resources had been handed over from SJ to Banverket. Currently, about twenty train operating companies use the Swedish state's rail infrastructure, most of them very small. On the passenger side, the state-owned company SJ Ltd is still the dominant operator, but Tågkompaniet and multinational firms like Veolia and Arriva are important competitors. In 2007, Danish DSB and British First Group jointly won the important tender for the Öresund trains (running in both Denmark and Sweden) and will enter in 2009. In terms of passenger kilometres, SJ Ltd had a 40 per cent share of all railway services in 2007 (SJ AB, 2008). Green Cargo, formed out of the former freight division of SJ, is the largest rail freight operator, with a 65 per cent market share in rail freight transportation in 2007 (Green Cargo AB, 2008).

New entrants, in particular BK Tåg and Tågkompaniet, have sometimes introduced new and innovative practices to the sector. BK Tåg made use of its experience from the bus sector, changing train-specific engines and other spare parts to standardized and less expensive bus parts. The company also reformed the working conditions of the drivers, getting them more involved in the whole process of delivering train services. Tågkompaniet introduced new pricing schemes and created a new and more user-

friendly booking system (Alexandersson *et al.*, 2000).

Typically, tendering procedures have resulted in public subsidy reductions to the magnitude of 20 per cent in the first round. For the services procured by the state, substantial reductions were accomplished during the first two years of tendering, despite the lack of actual new entry. After that, a period of tenders implying stable subsidies followed. When several new firms were finally able to win these tenders in 1999, additional large subsidy reductions (28 per cent) were achieved.

The decentralized responsibility for regional passenger rail lines, making them organized by the same authorities as are responsible for public bus services, appears to have brought about better coordination of regional train services with bus services. Combined with the high level of ambition among many CPTAs to develop the regional train services, this has probably played an important role in the positive development of railway travel. Passenger train transportation has, since 1995, experienced a stronger growth than all other modes in terms of passenger kilometres. Behind this increase of 32 per cent, we find that the growth in short-distance regional transportation has been particularly strong (up more than 70 per cent), while long-distance travel (more than 100 km) increased by 15 per cent.

The number of bidders taking part in Swedish passenger rail tenders has been rather low. On average, the CPTAs' tenders for gross cost contracts – in which the operator bears no ticket revenue risk – have attracted more bidders (2–3) than the state's tenders for net cost contracts (1–2) – where the operator gets the revenues from fares. A recurrent problem has also been the non-fulfilment of tendered contracts. In all these cases the railway passengers have been put at a disadvantage by disruption of the services, fewer trains or trains being temporarily replaced by buses. Loss-creating contracts have ultimately lead to bankruptcies on two occasions – Sydvästen in 2000 and BK Tåg in 2005. Having placed several too optimistic bids SJ Ltd came close to bankruptcy in 2002–2003, and was saved mainly because the state stepped in with additional capital of €200 million. Litigation is also increasingly being used. In 2000, SJ was sentenced to a fine and paid substantial damages to BK Tåg, after losing a court case on under-pricing fought against the Swedish Competition Authority. This verdict came a full seven years after the malpractice occurred, and in most cases the Competition Act has not been a suitable tool to tackle the problem (since it presupposes a dominant company is doing the malpractice). Instead, procurement legislation has been put to the test but with limited effect, although procuring authorities have become better in defining the contract award selection criteria and scrutinizing the bids.

Great Britain

In the 1970s, British Rail (BR) was facing growing criticism for low productivity, inefficient management and ever increasing subsidies (Pryke and Dodgson, 1975). In the early 1980s BR experienced a severe financial crisis, forming the background to the work of the so-called Serpell committee. In its report, it was argued that major closures were necessary to reduce the need for subsidies (Serpell, 1982). Partly due to political concerns, BR was instead reorganized into several commercially-oriented business sectors. This seems to have led to a remarkable improvement in BR's productivity during the 1980s. Nevertheless, from 1983 onwards, several academics and right-wing thinkers argued for rail privatization (see for example Redwood, 1988).

When BR's financial situation once again deteriorated in the early 1990s, the search for an appropriate form of privatization was intensified (Nash and Preston, 1993). In July 1992, the Conservative government presented a White Paper called 'New Opportunities for the Railways' that set out a

number of policy intentions to be achieved by April 1997, including the privatization of British Rail's freight businesses, franchising a substantial number of passenger services, and restructuring British Rail to own and operate track and infrastructure separately from operations (Department of Transport, 1992).

The stated aims behind the railway privatization reform were to make better use of the railways, ensure greater responsiveness to the customer, achieve a higher quality of service and better value for money for the public who travel by rail (OPRAF, 1995, p. 29). The economic rationale was developed in more detail by the special adviser on rail privatization, Sir Christopher Foster (Foster, 1994). He took the principal view that rail privatization would achieve greater economic efficiency due to the superior incentives provided by the private sector.

The White Paper was followed by the passing of the Railways Act in November 1993. The Act laid the ground rules for the privatization of British Rail, setting out the regulatory and statutory conditions under which this process, beginning in April 1994, could be undertaken. The company Railtrack was created by the Act, having as its key purpose to own, maintain and develop Britain's mainline rail infrastructure. The decision to have a single rail infrastructure owner was based upon the belief that this part of the railway business bears the characteristics of a natural monopoly. In November 1994 the government announced its decision also to privatize Railtrack. The sale was completed in 1996 when the shares were floated on the stock market.

The rolling stock was divided between three separate Rolling Stock Companies, which were subsequently sold to the private sector in 1995–1996. BR's freight business was privatized and open access for freight operators was introduced. BR's passenger rail operations were reorganized into twenty-five separate units, then transformed into Train Operating Companies (TOC). These companies were subsequently franchised by means of a tendering procedure, with interested parties placing bids on the grounds of required subsidies. The tenders were organized by the newly created Office of Passenger Rail Franchising (OPRAF) and the process was completed in March 1997.

Including the sales of the supporting businesses, BR was divided into more than eighty separate companies, the intention being to create competition in as many parts of the sector as possible (Nash, 1997). A number of new regulations were also designed with the purpose of encouraging competition and guarding the passengers' interests concerning prices and coordination of rail services. The overall responsibility for making sure that the different actors followed these rules was placed in the hands of the Office of the Rail Regulator (ORR).

The whole reform was completed in April 1997, not long before the Parliamentary Election in which the Conservative party's eighteen-year reign was brought to an end. The winning Labour party decided not to reverse rail privatization (as it had promised), but to expand investment and strengthen the regulatory body. OPRAF was transformed into the new Strategic Rail Authority, established in 2001. The new authority set out to re-franchise the operations of the TOCs and introduce longer agreements (twenty years instead of seven years) in return for TOC involvement in infrastructure investment. Railtrack was perceived as lacking the ability to invest enough on its own, and the new idea was to finance major infrastructure improvements from a variety of sources (SRA grants and private capital), while Railtrack would buy the assets once they had been completed (Nash and Smith, 2006). However, for a number of reasons, the ambitious plans did not materialize. The Hatfield accident in 2000 set off a series of events that eventually lead to the collapse of Railtrack, being replaced by a non-profit company, Network Rail. Also, several TOCs turned out to have problems in fulfilling their obligations (see

further below). Therefore, several franchises were re-negotiated to temporary cost-plus contracts in order to be later re-franchised with the old contract length of seven years. Infrastructure investment did increase, but the funds were directed to maintain and renew the existing network rather than to perform major upgrades.

Experience and Effects. Although the response from the private sector to franchising of train operating companies was lukewarm in the beginning, the original bidding process in 1995–1997 was very competitive, with 5–10 serious bids for each franchise. Including a couple of management-buy-outs, a total of eleven separate organizations entered the UK passenger train industry by means of winning franchises in tenders. Companies related to the bus industry (such as Stagecoach, National Express and First Bus) were very successful. National Express won more franchises (five) than anyone else, while French conglomerate Connex grabbed the biggest market share (16 per cent of ticket revenues) (Alexandersson *et al.*, 1997).

Since privatization started, there has been a substantial concentration in terms of the owners behind different franchisees and also a reduction in the number of franchises – down from twenty-five in 1997 to twenty in 2008 (Association of Train Operating Companies, 2008). In addition, there are six non-franchised passenger services, operating under the open access regime. There is an important presence of multinational companies, also including foreign-originated ones like Keolis (France), NS (The Netherlands), MTR (Hong Kong) and DB (Germany). When re-franchised, competition has generally continued to be strong. On one occasion a tender was stopped prematurely since only two operators were pre-qualified (Nash and Smith, 2006). It has generally been difficult for the incumbents to defend their franchise in tenders.

The TOCs were to be paid annual subsidies according to net cost agreements, typically to be reduced over the contract period. In some cases it was even envisaged that the TOCs would be able to make enough profits to be able to pay back money towards the end of the contract period. However, in several cases, these subsidy levels turned out to be insufficient and in a couple of cases the winning bidders were clearly too optimistic. For this reason, some franchises had to be renegotiated or re-franchised early, for example leading to the exit of Connex altogether in 2003 (Nash and Smith, 2006) and of Sea Containers and its subsidiary GNER in 2007 (BBC News, 14 August 2007).

After some initial reductions in the subsidies to train operators, they are now considerably higher than projected – almost back to the level at the beginning – and are expected to rise further when track access charges are increased to account for the revised costs of Network Rail. Since the collapse of Railtrack, there has actually been nothing less than a cost explosion in the British rail industry, related not only to rising costs of infrastructure maintenance and renewals, but also to train operations and rolling stock investments. Some of the cost increases can be explained by higher fuel prices and sharply rising wages when different TOCs compete for existing staff. However, substantial parts of the increased costs remain difficult to explain (Nash and Smith, 2006).

In terms of demand, the British experience is much more positive, with a 40 per cent increase in passenger kilometres between 1995 and 2004 (Kirchner, 2007). Although it is clear that passenger demand and revenue have increased substantially since privatization, it is difficult to establish the relative importance of privatization compared to the multiple other reasons, including the (until recently) booming economy, behind this development (Nash and Smith, 2006).

Germany

Beginning in the 1960s, rising deficits led

to several attempts to reform the German railway sector. Most of these failed, due to opposing interest groups and the lack of a broad political consensus on suggested reforms. The deficits of the national railway operator in Western Germany, Deutsche Bundesbahn (DB), increasingly became a major fiscal burden for the federal budget, reaching a record level of about €7.5 billion in 1990. From 1960 to 1990, rail's market share compared to road transportation also declined from 37.3 per cent to 20.6 per cent. When the re-unification of Germany in 1990 also added the problems of Deutsche Reichbahn (DR), it became clear that fundamental reforms were absolutely necessary in the German railway sector (Kirchner, 2005).

A Government Commission of 1991 proposed a far-reaching structural reform by means of the creation of a new holding company that initially would be owned by the federal government but later privatized (Kirchner, 2005). The suggested reforms were put forward as national solutions to national problems, but were also influenced by the parallel work on the European Community level which led to Directive 91/440/EEC.

In 1993, the suggested reforms started to be put into practice. The two national operators DB and DR were merged into Bundeseisenbahnvermoegen (BEV), forming a special federal government railway asset. Deutsche Bahn AG (DB AG) was then spun off from BEV's assets, forming a new private stock corporation in January 1994, with subsidiaries for long-distance passenger services, regional passenger services, freight services, railway services and the track network. Cross-subsidization between these entities was prohibited. DB AG was supposed to operate on a commercial basis with full responsibility for costs and revenues, and the separation into different units was supposed to improve transparency and enable the units to work as profit-centres close to the market (Lehmann, 1999). The separation of long-distance from regional passenger services was linked to the regionalization (see below) and a fear among the states that DB AG would otherwise cross-subsidize the long-distance services with revenues from the regional services.

DB AG was kept under federal government ownership, but changes in the constitution were made to make it possible to sell stocks to the public later on, with the exception of such railway undertakings that functioned as infrastructure managers.

Open access on non-discriminatory terms was introduced for all German railway companies and also for EU Member State companies. A new federal regulatory body was set up. BEV relieved the former national operators of debts and other financial burdens, amounting to a massive €63 billion (Kirchner, 2005).

Another important element of the reforms was the regionalization of regional passenger services. In 1996, the German states (Länder) became responsible for the regional passenger services, receiving subsidies from the federal government to keep socially important public train services. Some states have chosen to put these services out to tendering, while others have chosen only to close contracts with DB Regio (a subsidiary to Deutsche Bahn AG) (Kirchner, 2005).

In 1999, the reform process took another step, transforming the five operative divisions of Deutsche Bahn AG (now a holding company) into independent corporations. One of these is DB Netz, the track infrastructure provider. This model of 'less than complete' vertical separation of infrastructure from operations has been the subject of much debate, since some politicians and researchers have claimed that it is not sufficient to exclude discrimination against other operators (despite additional measures such as a regulatory body and specific regulations). Others have defended the model as a way to keep some of the benefits of integration, such as lower transaction costs and possibilities for track-wheel innovations (Lehmann, 1999; Kirchner, 2005).

In 2007, the idea at least partially (25 per

cent) to privatize Deutsche Bahn resurfaced, with discussions between DB and the federal government being initiated on the topic.

Experience and Effects. Initial regional tenders performed by the states attracted only a few bidders. Rather commonly, local publicly-owned organizations or DB Regio won the tenders. For several years no new company entered the long-distance passenger market, despite the open access (Lehmann, 1999).

In recent years, the number of new entrants has increased. A total of over 330 railway companies are now present, most of them operating in the freight sector. Although it is growing, the combined market share of the new operators is still low in rail passenger transportation (about 7 per cent), while it has reached 16 per cent in freight transportation (Kirchner, 2007). In particular, French firms (such as Veolia, Transdev and Keolis) are very active in Germany (Deutsche Bahn, 2004). In 2004, British Arriva entered in a major way by means of several acquisitions (Deutsche Bahn, 2005).

Between 2001 and 2004, a total of thirty-nine tenders were carried out, with contract lengths from three to fifteen years (Brenck *et al*., 2005). Although contracts are commonly used in local and regional passenger services, they are not always awarded through tendering, and there are still some obstacles related to access pricing, rolling stock approval, administration and information (Kirchner, 2005). The practice of direct awards in some areas, rather than tendering, is being challenged at the EU level. There have been cases of very low bids in regional tenders, and also too optimistic efforts to start new long-distance passenger services, leading to the exit of some firms (Deutsche Bahn, 2004, 2005).

Passenger rail services have increased their market shares since 1993 compared to other modes, reaching 9.4 per cent in 2006. There is some research indicating that competitively procured passenger lines grow faster (in terms of frequency) than other lines (Lalive and Schmutzler, 2005). After several years of declining shares for rail freight services, the modal share increased from 15.2 per cent to 17.4 per cent between 1999 and 2006. (Kirchner, 2005, 2007).

The Netherlands

The railway reform process in the Netherlands was initiated in 1991 by means of the recommendations of a committee appointed by the Ministry of Transport, stating the need to make the national railway company Nederlandse Spoorwegen (NS) independent of subsidies. The first actual reforms were implemented in 1995 with the reorganization of NS into several subsidiaries and subdivisions. The subsidiary NS Groep included those divisions that were supposed to work under market principles (including passenger services, stations, and real estate) and was supposed to become privatized in the future. Infrastructure and related issues were to be handled by three task organizations within NS, although directly financed by the Ministry. The reforms of 1995 included an agreement to set the infrastructure access charges to zero until the year 2000, in return for a reduction in state subsidies from €130 million in 1995 to zero in 2000 for a defined network that was supposed to be able to cover its operational costs (excluding infrastructure costs). A special contract agreement on continuous subsidies was reached for a set of other loss-making lines with socially desirable services (Van de Velde, 2005).

The original committee had not proposed the introduction of competition in passenger services. Nevertheless, the reforms of 1995 made competition a possible option. An experiment with on-the-track competition came into effect after private company Lovers Rail asked for permission to add services on some lines already operated by NS. The initiative lasted from 1996 to 1999 (when the new entrant went bankrupt). During this period, the government also actively

sought information and experiences from the introduction of railway competition in other countries.

In 1999, a new administration issued a policy document that both broke with the on-the-track competition experiment and rejected a British franchising model for the national network as had been suggested by the former liberal administration. Instead, it suggested that NS should be given a ten-year concession to run the profitable part of the national network in accordance with a performance contract, including a number of obligations, incentives and targets. On the other hand, loss making regional services would increasingly be subjected to competitive tendering. While the new performance contract became delayed several years due to political opposition and NS's problems in fulfilling the targets in a transitional contract, a new transport law came into effect in 2000. It introduced the principle of 'authority initiative' rather than 'market initiative'. Under this principle, competitive tendering was to be used in all public transportation, mainly affecting the regional bus and train services. New regional transport authorities were created, and some tendering of regional lines was performed, but more commonly the threat of tendering was used in order to stimulate the creation of integrated bus and rail networks.

In 2002 a full separation of infrastructure management from operations was implemented and a new state-owned rail infrastructure organization, ProRail, was created in 2003. A new monitoring and regulatory body, Office of Transport Regulation, was established in 2004 as a part of the National Competition Authority.

In 2004, the ten-year concession and performance contract for the trunk rail network was finally settled, coming into effect in 2005. NS was granted this exclusive concession, which includes a number of performance clauses on gradual improvements but no payment from the state to NS. An evaluation in 2008 may result in a competitive tender, but NS is no longer set to be privatized. This concession was only one part of a new long-term regime for the railways, aiming at achieving a reliable railway system. Another ten-year concession was granted to ProRail for the management of infrastructure. Also, several measures were taken to improve cooperation and coordination between infrastructure management and the train operators.

In December 2005, the central government decided that the process of decentralization and competitive tendering of regional lines will continue, in order to include more lines (van Dijk, 2006).

Experience and Effects. The introduction of contract agreements and (threats of) competitive tendering generally seems to have put pressure on NS to keep costs down, thereby making reduced subsidies possible. For example, the initial contract for the non-profitable lines reduced subsidies by 50 per cent. However, NS has had a hard time reaching the envisioned targets and it seems as if excessive focus on rationalization led to a low reliability of both infrastructure and vehicles. Political uncertainty on how to proceed with reforms (regarding, for example, competition and privatization), lack of governmental supervision of the task organizations, and too much focus on new infrastructure investment projects rather than infrastructure maintenance, created an unstable environment for the railways. This may have contributed to the reduced performance and a related drop in patronage after 2000 back to 1995 levels (van de Velde, 2005).

Competitive tendering has gradually been tried by more and more regional authorities, but has so far only affected about 6 per cent of the Dutch network (van Dijk, 2006). Partly depending on the conditions in the tenders, the resulting contracts have implied either a gain in the overall level of service (such as new rolling stock and/or higher frequency of operations), or substantially lower subsidies

Table 2. Rail reforms: four-country comparison.

Country	*Years of Main Reforms*	*Elements of Reforms*	*Process*	*Rationale and Arguments*	*New Entrants*	*Outcome and Experience*	
						Positive	*Negative*
Sweden	1988, 1993, 2000	Vertical and horizontal separation, regionalization, tendering	Step-by-step (slow)	Save and expand railway services, facilitate infrastructure spending, reduce direct subsidies	Several (national and international)	Increased travelling and coordination of services, some innovations, reduced subsidies	Predatory bidding, sometimes limited competition in tenders, recurrent problems for incumbent
Great Britain	1994-97	Vertical and horizontal separation, privatization, tendering	Step-by-step (fast)	Tackle financial problems, increase quality and efficiency, superiority of private ownership	Many (national and international)	Increased travelling, good level of competition in tenders, initial subsidy reductions	Predatory bidding, collapse of infrastructure company, rising costs
Germany	1993, 1996, 1999	Partial vertical separation, tendering, open access, regionalization	Step-by-step	Need for restructuring following re-unification, improve customer orientation	Many (national and international)	Many entrants (eventually), increased market shares for rail	Initial lack of competition, cases of too optimistic bids and open access entrants
Netherlands	1995, 2002, 2004	Tendering, performance contract, vertical separation, regionalization	Step-by step (slow)	Reduce subsidies, long-term reliability of railways	A few (mostly international)	More services and/or (sometimes sharply) reduced subsidies	Reduced reliability of infrastructure and rolling stock, reduced travelling

(20–50 per cent) for the same level of supply. This may be compared to some directly awarded contracts that have only implied gains up to 10 per cent. Contract periods have varied from five to six years to ten to fifteen years (the latter involving investments in new rolling stock).

A couple of new entrants have appeared. Apart from the case of Lovers Rail entering in on-the-track competition with NS, entry has occurred through the competitive tendering of regional lines, with multinational companies like Arriva and Connexxion taking the lead (van Dijk, 2006). In addition to this, the demand for coordinated bus and railway services has initiated the creation of some new consortia of firms of different origin, such as NS and Arriva and NS and Keolis. NS and KLM have also created a joint venture for running new high-speed lines under an exclusive franchise until 2022 (Kirchner, 2007). The brief history of Lovers Rail (which ultimately went bankrupt due to the lack of an integrated ticketing with NS) showed that even if the new operator did not actually enter into some parts of the network for which it had been granted permission, the mere threat made NS expand and improve its services in these areas (van de Velde, 2005).

Summary and Comparison

Table 2 summarizes some of the key aspects of the development in the four countries studied, including the most important outcome and experience regarding passenger rail services, divided into 'positive' and 'negative' aspects. Reforms more often than not seem to have sprung out of necessity. It is clear that they have typically been taken step-by-step, but in contrast to the very early initiated but then prolonged process of reforms in Sweden, Great Britain transformed its entire railway industry in a mere three years. While vertical separation and tendering have been tried by all countries – at least to some extent – only Great Britain opted fully for privatization. The Netherlands stand out with their choice of a performance-based contract with the incumbent as a (temporary) alternative to other reforms. A reduced need for subsidies (at least initially) is shared by all countries as a positive aspect, while predatory bidding or similar problems have also been common. Although not a comprehensive comparison, the compiled data indicate that the country implementing the least radical reforms (the Netherlands), and also doing it late – thereby getting a more limited impact in terms of new entry and competition – is also showing a relatively less favourable outcome.

Conclusions

When sectors such as the railway industry, which for a long time have been dominated by public control and ownership, are opened up for competition, it typically leads to a market transition in which private firms become more important. As has been shown above, the processes leading to this development, and the impact, have differed between countries, sometimes being largely dependent upon national policies and objectives. In some cases, private firms have been able to challenge public firms in tenders for public services; in other cases governments have decided to sell public firms or assets to the private sector, with or without any element of competition.

Following initial reforms of vertical separation of infrastructure from operations in Europe, the introduction of competitive tendering 'for the track' has been a rather simple way of creating a more competitive environment without losing too much control of services that are still commonly viewed as being the responsibility of the public sector. One might even say that the role of public authorities has been strengthened in the process, by means of defining more strictly which services to be purchased and how to pay for them.

Experience of rail privatization and competitive tendering in Europe is to a large extent a mixed bag. Drawing from the four

case studies presented here, competition (or sometimes only the threat of competition) has clearly served to decrease the need for subsidies and to make firms more cost efficient. New entrants have also sometimes introduced interesting innovative practices, although data on this are scarce for most countries. Railway reforms have often (but not always) been followed by an increase in travelling, but the exact relationship may be very complex (travelling also being affected by business cycles and additional public spending on infrastructure and high-speed trains). Unfortunately, competitive tenders have also triggered strategic firm behaviour resulting in too optimistic bids, ultimately with very negative consequences for travellers. Another problem has been the lack of bidders in some countries, limiting actual competition. Regarding the role of the private sector, no country has put such emphasis on decreased public ownership of railway assets through privatization as Great Britain. In retrospect, it would appear that the inclusion of the track infrastructure in this policy was either to take it one step too far, or, alternatively, was carried out without enough care regarding the creation of the appropriate regulatory framework or incentive structures to go with this reform.

Competitive tendering has hitherto been a tool primarily to increase cost efficiency and reduce public spending, although contracts with a strong focus on ticket revenues (such as in Sweden's interregional rail services and in the British franchises) by definition also include incentives to address market development and meet end customer demands. A relevant question is whether the European passenger railway sector can become sensitive enough to its customers without also allowing for more open access and on-the-track competition.

Future Outlook

For the time being, the European railway market seems to be at a point where there is still room for experiments with new reforms, while at the same time both old and new companies are searching for better ways to make use of the new situation. National barriers are beginning to be dismantled, and international railway operators have already been established. Similarly, the rolling stock manufacture is concentrated in a few large multinational corporations. If competition continues to increase in both national and international railway markets (as more recent EU reforms are implemented) we may see a wave of structural changes in the form of mergers or acquisitions. This could lead to even larger corporations in the railway industry, as has been the case in other deregulated network-related industries such as telecommunications and electric utilities. In fact, despite almost twenty years of substantial changes in the European market for passenger services, the most profound impact of these changes may still lie ahead of us.

NOTE

1. This section partly draws from Alexandersson and Hultén (2006).

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Essay 5

Predatory Bidding in Competitive Tenders – a Swedish Case Study

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Predatory bidding in competitive tenders: A Swedish case study

Gunnar Alexandersson · Staffan Hultén

Abstract Public procurement by competitive tendering is an important part of European policies to encourage competition in network industries previously dominated by public companies. In recent years, the appearance of very low bids has become an issue in several countries. We discuss predatory bidding from a theoretical, practical and legislative point of view. A case of tendering for train services in Sweden is used to illustrate the possibilities to detect an abnormally low bid. An analysis of projected costs and revenues is complemented with a method using historical data on previous tenders. One conclusion is that there is scope for reform in national competition policies in European Union member states concerning multinational enterprises participating in local tenders.

Keywords Deregulation · Railways · Competitive tendering · Predatory bidding

JEL Classification K21 · K23 · L12 · L43 · L92

Introduction

The deregulation of the railway industry is one example of the striving for a common European market for goods and services, a process intensified since the late 1980's. This paper deals with a policy problem raised by the introduction of competitive tendering in the formerly protected national passenger railway markets: the use of

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predatory bids by powerful players seeking either to protect a market or to enter a new market.

The process of "Europeanisation" of the former national economies in Europe has increasingly affected the competition policy in the union's member states (see e.g. Vickers, 2001; Morgan, 2001; Dabbah, 2003). One part of this development is regulatory changes and creation of institutions aiming at facilitating entry of foreign firms to former protected national markets, often in the public sector of the economy. For example, increased use of public procurement by competitive tendering is supposed to increase competition, save taxpayers' money and safeguard equal treatment for competing firms, regardless of nationality (European Commission, 1996). Generally, the use of this form of franchise bidding seems to have been much more widely applied in Europe than in ak e.g. USA.[1]

The European transportation industry, not least the railway sector, has been particularly affected by this development, implying important structural changes in several countries. For instance, EU member states like Sweden, Great Britain, Denmark, Germany and the Netherlands have introduced tendering of railway services. The European Directive 91/440 on the separation of accounts for infrastructure from operations has commonly functioned as a starting point for railway reforms, although specific problems and events at the national level have also played an important role. An overview and interpretation of how far rail liberalization has progressed in the countries of the European Union is provided in reports of the so-called rail liberalization index (Kirchner, 2003, 2004).

The "Europeanisation" of the railway market highlights one general issue: the functioning of competition policy at national markets when there is increased competition from large foreign firms. Among the specific problems is the appearance of very low bids in tenders, sometimes linked to later failures of winning firms to deliver the contracted train services.[2] Examples may be found in Sweden, Great Britain and Germany, contributing to a growing concern for negative effects of competitive tendering at the national and regional level.

In the next section of the paper, we explore the possible reasons why companies place low bids, and the short-run and long-run socio-economic consequences of a low bid winning a tender. We then present the legislator's view on low bids, in order to clarify the circumstances when a bid may be considered abnormally low. This is followed by a section devoted to a much-publicized case on the tender for the

[1] In Europe, Great Britain's Act of 1980 on Compulsory Competitive Tendering was an important early step in extending the operation of market forces to services provided by local government, as described by Adnett (1998). The theoretical history of franchise bidding is described by Harstad and Crew (1999), dealing also with the principal critique against the method and other possible reasons behind its limited practical use (at least in an American context). Harstad and Crew argue that it is time to reconsider the potential of franchise bidding as a viable alternative to e.g. price-cap regulation. A recent article by Doni (2004) adds to their analysis by showing that some parts of the theoretical critique against franchise bidding does not hold when relaxing the (unrealistic) assumption that the information (on e.g. production technology and cost structure) held by the procuring entity or regulator is symmetric with that of the competing firms.

[2] In this article, we use the word "tender"when we talk about the process of procuring certain services or goods. The word "bid" is then used to describe an offer placed by a firm in such a tender or another auctioning process. Some authors and some legislatory text use the word "tender" as a synonym to "bid" which we believe may cause some confusion. We only use this wording when it appears directly in the cited references.

trains to northern Sweden. The outcome of the aftermath of this tender is likely to be of principle importance for the industry and for the current system of competitive tendering in Sweden. The case study includes two methods, complementing each other, to determine the existence of too low bids. The first method is a reconstruction of the projected costs and revenues underlying the bids in the specific tender. The second method is a more general bottom-line approach, using historical data for comparative cases. The concluding section addresses three issues. Firstly, was the winning bid in the investigated tender abnormally low and predatory? Secondly, is there a risk that the bid will result in negative socio-economic consequences? Thirdly, how can national competition policy and legislation be amended and re-interpreted in a European context in order to avoid the problems related to abnormally low bids?

1. Predatory bidding and related issues

Why do firms place very low bids in tenders? In the desirable case, the explanation is that some firms do have a unique competence on production methods that result in a completely different cost structure or possibilities for additional income compared to their competitors. One important factor may be that some firms are able to gain from economies of scale or scope.

In addition to this, there are several possible explanations for low bids that are less attractive from a socio-economic point of view. These become relevant when the bids get so low that they may be declared "abnormally" low. Based upon the literature, we have identified three main categories of explanations for abnormally low bids in tenders. Firstly, such bids may aim at ousting or at least weakening competitors. Secondly, a subsidiary to the procuring organization may place a bid that, if it turns out to be impossible to fulfil, presupposes more money from the owner. Thirdly, abnormally low bids may simply be explained by carelessness or ignorance.[3] As we will develop further below, these alternative reasons behind abnormally low bids are related to different bidding strategies and decision-making and may also lead to different outcomes.

In the first case, the firm may practice dumped prices with a consciously calculated loss, or is able to use profits gained in other branches of its business through cross-subsidization. This bidding behavior is analogous to a strategy of *predatory pricing*. Such a strategy is generally assumed to hit competitors first, making them exit the particular market. In the second phase, consumers are affected. After having enjoyed a period of temporarily low prices, they come to face higher prices and a deteriorated supply. With few exceptions, the literature on predatory pricing presumes that a large incumbent firm practices the strategy in order to force minor new entrants to exit.[4] Sometimes the firm is dominant on other parts of the market than the one where the practice is applied.

[3] A similar but more detailed listing of reasons can be found in the DGIII report on Abnormally Low Tenders (1999).

[4] One exception is an article by Lindsey and West (2003), discussing predatory pricing in markets characterized by imperfect competition and differentiated products. Another example is a study on predatory pricing in network markets (Farrell and Katz, 2001).

In journals of economics as well as in journals of law, predatory pricing has been a lively debated subject for a long time. One major problem is the difficulty to separate predatory pricing from the sometimes fierce but legitimate price competition between firms (see e.g. Niels and Ten Kate, 2000). While some industrial economists have based their analyses on historical evidence, advocates of the Chicago School have claimed that predatory pricing should be rare — if existing at all. Their main argument is that such a strategy is seldom or never rational from an economic point of view, since it is costly (compared to e.g. acquiring competitors) and often difficult to recoup by future monopoly profits due to entry of new competitors (Ten Kate and Niels, 2002). However, during the past 20 years, the views on predatory pricing have changed. The development within the fields of decision theory and game theory has shown that the strategy may be rational in the presence of asymmetric information between different actors, for instance between incumbents and entrants or between management and investors. Small firms with very competitive and innovative products appear to be particularly prone to successful attacks of predatory pricing, since their lenders typically have stronger incentives to pull the plug than to run with the risk (Grout, 2000). Moreover, aggressive pricing and other practices may function as strong signals to new firms, deterring entry to certain markets (Roberts, 1986). If predatory pricing is a rational strategy or not will ultimately depend on the objectives of the practicing firm. Something that appears to be irrational from a profit-maximizing perspective may be rational when other objectives are taken into account (Ten Kate and Niels, 2002).

At this point, it might be useful to make a distinction between reactions to an abnormally low bid and one that is only marginally lower than the bids from other firms. If the winning bid is marginally lower, it is likely that the other players in the market will consider the bid to be "fair". Therefore, they will find it interesting to stay in the market and try to rationalize their businesses until the next tender comes along. If, however, an abnormally low bid wins, the competitors may interpret this as a signal that the bidder is prepared to do whatever it takes to conquer or keep a certain position of the market. It then becomes pointless to compete on the basis of normal rates of return, and chances are that competition erodes. In markets where there are substantial barriers to entry, it is also less likely that new competitors will try to enter even if a higher bid level is re-established in the future. Therefore, such markets may be more attractive for a company practicing a predatory bidding strategy.

The second type of explanation for abnormally low bids may be viewed as a special case of the first. A common complaint to the Swedish Competition Authority is that companies owned by municipalities or county councils apply pricing below costs in public tenders, signifying a "hidden tax subsidy" (Konkurrensverket, 2004). A related accusation is that low bids from public companies are based upon lower expected rates of return compared to competing private firms.[5] Some defenders of the Chicago School (see for example Lott, 1999) have argued that publicly owned companies are the only ones that actually may commit to a predatory-pricing strategy.

It also happens that firms make more or less serious mistakes when calculating their bids. Some mistakes may be due to shortcomings of the internal information systems, producing false impressions of costs and revenues. The basic data provided by the

[5] A similar point is made in the DGIII report (1999) on abnormally low tenders in the construction industry.

procuring authority may sometimes contain incomplete or incorrect information on the tendered business, leading to faulty calculations. In this third category of explanations, we also include firms that have unrealistic expectations on the possibility to perform changes in a certain business, or underestimate the development of costs in the industry. This is probably more common among new entrants than incumbent firms. In auction theory, the concept of *winner's curse* is used to explain why winning bids may be based upon judgmental failures. In particular, *common value auctions*—in which the participating bidders value items differently based upon their judgment of uncertain prospects—tend to be won by the bidder with the most optimistic estimate of the item's value, unless pre-emptive actions are applied (see e.g. Kagel and Levin, 1986). Competitive tenders of public services typically show similarities to common value auctions with a sealed-bid procedure. Adnett (1998) discusses winner's curse in relation to such tendering procedures. He argues that a low number of bidders, and in particular if they are inexperienced as in the first round of tendering in a certain business, will increase the importance of winner's curse in competitive tenders. One way to limit the problem of winner's curse is to alter the auctioning procedure. An open English auction, in which the bidders continuously follow the bids of their rivals, may stimulate aggressive bidding but yet decrease the risk of too optimistic bids and the related winner's curse (Milgrom and Weber, 1982). However, there is an increased risk of collusion in open auctions (see e.g. Robinson, 1985).

The special circumstances related to public procurement entail some specific problems that are rarely observed on ordinary markets. The procuring entity has a strong position as a buyer, sometimes close to a monopsonist. Its purchases and buying behavior determine the range and limits of the actual market. A supplier that wins a tender enjoys a monopoly-like position during the contract period, but its actual powers are often very restricted, e.g. in terms of its possibilities to influence prices and supply. The end consumers are bound to use the supplier chosen by the procuring entity.[6]

Bids that lead to low profitability or even losses create a risk that the supplier will not be able to fulfil the conditions of the contract. Sometimes this will become obvious already when the shift from the former to the new contractor is about to take place. In the short run, this may cause sudden interruptions in delivery, resulting in considerable consequences, e.g. for services like public transportation. The procuring authority may be forced to purchase the goods or services from another firm, sometimes at considerable additional costs. When this is not an option, end consumers, such as bus and train passengers, will face big transportation problems, which may have negative socio-economic and environmental effects. In a longer perspective, the confidence for the supply of goods and services is deteriorated, and firms that contribute to a healthy competition may leave the industry. Thereby, the future price competition as well as the innovativity of the industry may be harmed.

It has been suggested by some authors (see for example Calveras et al., 2004) that *surety bonds* may be a way to deter submission of abnormally low bids and handle the risks associated with non-performing bidders. Although surety bonds may help to reduce the problem of bids based upon flawed calculations or unrealistic expectations, they will probably not deter a bidder from consciously placing a very

[6] Similar observations on public procurement characteristics have been made by Sorana (2000).

low bid for strategic reasons. As a guarantee against interrupted delivery or complete withdrawal due to financial distress, e.g. by assuring commitment from company owners, a surety bond may be an appropriate instrument. However, its applicability is probably very dependent on industry characteristics. Surety bonds seem to work well in the construction industry, where the aim is to make sure that a building or any type of construction is completed.[7] In industries like public transportation, where continuous daily service performance is critical, their relevance is more uncertain. For example, even strong commitment and ample financial resources will not immediately remedy problems such as a lack of trained personnel, related to mistakes in the planning process of a company set to take over a service.

Public procurement also means that actual competition between firms for a specific part of the market only takes place at discrete points in time, often with several years in between. This affects the continuity of the seller structure, and thereby competition, over time. Even if other public tenders, concerning other parts of the market, may happen during these years, a loss in a tender that represents a major part in a firm's business may lead to the dismantling of the firm altogether. It may be argued that firms that are efficient in the long run would always have the alternative to borrow money (see for example Strand, 2004). However, this option does not seem to be realistic in situations when firms need to survive long periods of no or much reduced business activity, with only a chance (not certainty) to win a future tender.[8]

2. The legislator's view on low bids in tenders

The increasing literature of recent years on predatory pricing as a real problem has yet to affect the law in the U.S. and Canada. The focus is upon dominant firms acting against new entrants. Since predatory pricing presupposes the possibility of recoupment by monopoly pricing in the future, an analysis of market structure is critical when judging whether or not predatory pricing has occurred. For example, if entry barriers are low, predatory pricing is assumed not to be economically rational. Therefore, neither the objectives of the accused firm, nor its pricing related to costs may even be considered worthy of investigation (Niels and Ten Kate, 2000). Consequently, it is currently very difficult to prove before a Canadian or U.S. court that predatory pricing has actually occurred (Niels and Ten Kate, 2000, p. 795; Edlin 2001, p. 941).

EU legislation does not consider predatory pricing as such. Instead, it focuses on price reductions as one of several practices related to abuse of dominant position. EU case law, and especially the work of the European Commission in recent years, has resulted in a different view compared to the U.S. and Canada. This is also reflected in Britain's new Competition Act. The European Commission considers price reductions to be a serious matter (even if they don't result in prices below costs) whenever they are practiced by dominant firms and aimed at specific competitors. It is treated as price discrimination or cross-subsidization, regardless if the strategy may succeed or

[7] See for example the report prepared by the DGIII Working Group on Abnormally Low Tenders (1999).

[8] Eckert (2002) discusses the importance of speed of antitrust actions in order to avoid these types of problems.

not (Niels and Ten Kate, 2000; Grout, 2000).[9] When it comes to firms that are not dominant it is more difficult to find relevant regulations. Closest is the view on price promotions. In 2001, the European Commission rejected some national experts' call for a harmonized EU prohibition on prices below costs. The Commission argued, among other things, that such a strategy is an efficient marketing tool not least for minor firms and that possible negative consequences could be avoided through tougher demands for transparency in pricing towards competitors and end consumers (Commission of the European Communities 2001, pp. 12–13).

In Sweden, two laws, based upon EU legislation and directives, are relevant for handling the occurrence of very low bids in tenders: the Competition Act (SFS 1993:20) and the law (SFS 1992:1528) on public procurement (hereafter abbreviated LPP). The 19th paragraph of the Competition Act prohibits abuse of dominant position. In one case attracting much attention, pricing below costs in a tender was considered to be abusive. The case concerned a tender in 1993 for regional railway services in the counties of Jönköping and Halland (in the southern part of Sweden)—a tender won by Swedish State Railways (SJ) in competition with the incumbent operator BK Tåg.[10] The final verdict in this case did not come until early 2000, when a special court found SJ guilty of abusing its dominant position by means of under-pricing its services (Marknadsdomstolen, 2000). The court focussed on the intent behind the pricing practice and the relation between price and costs. SJ's behavior was considered to entail such a risk of deterioration of future competition that SJ later would have been able to recoup the financial losses caused by the bid. A key issue was if SJ could be considered to have a dominant position on the relevant market, and what that market was. In this case, the relevant market was defined as the market for contracted railway services in Sweden, on which SJ was a dominant player.

The Swedish Competition Authority does not find the Competition Law to be relevant when firms slash prices in order to enter a new market. As long as the firm is not dominant in the particular business sector in the relevant market (as defined by the Competition Authority), even a conscious dumping of prices may be accepted.[11]

Turning to the LPP, it includes a paragraph that states [in our translation]:

> "A procuring entity shall accept either: 1. the bid that is the economically most advantageous, or 2. the lowest bid. When evaluating which bid to be the economically most advantageous, the entity shall consider all circumstances such as price, time of delivery, operating costs, quality, esthetical, functional and technical characteristics, service, technical support, environmental effects etc."[12]

These circumstances shall be specified by the procuring entity. Another paragraph says [in our translation]:

[9] For an extensive review of the boundaries of dominant firms' pricing policies in the context of European competition law, see Henriksson (2003).

[10] BK Tåg, a private company with its roots in the bus industry, became a pioneering new entrant in 1990 after winning the first tender for these services.

[11] This view was expressed in an interview made by the public service radio broadcaster in Sweden, cited in Sveriges Radio (2003).

[12] SFS (1992:1528), paragraph 22.

> "A procuring entity may reject bids that it considers to be unreasonably low, but only after having requested a written explanation for the low bid without receiving a satisfactory answer."[13]

Of central interest here is what is meant by an "unreasonably low" bid. The law itself does not define the concept "unreasonably low" and there appears to be no Swedish preparatory work for guidance. This lack is due to the fact that the Swedish legislation is based upon EU regulation and directives.

It is also interesting to note that the choice of words describing these bids in Swedish legislation and court decisions does not conform to the EU standard. Sweden has chosen the word "unreasonably" while EU legislation uses the word "abnormally". It is beyond the scope of this article to discuss any possible implications of this difference for the actions of procuring authorities or the interpretation of the law in the juridical system.

There are only a few Swedish cases where procuring entities have rejected bids with reference to them being "unreasonably low". The view of NOU (a committee supervising public procurement) is that a reasonable explanation from the bidder is sufficient to avoid a bid being categorized as "unreasonably low". According to NOU, even dumping prices to enter a market is an acceptable justification. Hans Sylvén, chief lawyer at NOU, claimed that LPP provides no support for the rejection of a bid with reference to pricing below costs:

> "As a buyer you may not kick out a supplier due to the price being too low. If you believe that the technical ability and quality is fulfilled, the bid must be taken into consideration. . . There are also firms that calculate with losses and dump prices in order to enter the market. This is not prohibited either."[14]

The law only stipulates that a bid must not be "unreasonably low" in relation to the evaluation of the circumstances considered important by the procuring entity. In one case, the Swedish Supreme Court found that according to LPP a buyer must accept the lowest bid if it hasn't specified how other factors (apart from the price) will be evaluated. Failure to do so may result in damages amounting to the whole contract sum of the rejected bidder.[15] This implies that checking bids against the invitation to tender is of great importance to determine if a bid can be called "unreasonably low".

3. Deregulation and tendering in the Swedish railway sector

Following a step-by-step process that may be traced back to the 1960's, the Swedish railway sector has gradually been transformed from a vertically and horizontally integrated monopoly to an industry characterized by decentralization and multiple

[13] SFS (1992:1528), paragraph 23.

[14] The citation [in our translation] is from the Swedish daily *Nerikes Allehanda* (1999). NOU's views were expressed in relation to a case described also in *Nerikes Allehanda* (2000, 2002) and in the magazine *SAF-tidningen* (1999). NOU has later confirmed the view in Sveriges Radio (2003).

[15] This case is described in the Swedish daily *Svenska Dagbladet* (1996) and in the magazine *Lex Press* (1999).

suppliers of railway operations and supporting services.[16] The state still controls and maintains the railway infrastructure, by means of the authority Banverket, and is the owner of the most important railway operator SJ. Many railway lines are subjected to competitive tendering by public procurement, carried out by local authorities (local and regional lines) and the national authority *Rikstrafiken* (inter-regional lines). Since 1990, a total of six new railway operators have entered the Swedish market for passenger railway services. Of these, four remained as independent actors alongside SJ in 2004. It should be noted that a typical tender in the Swedish railway market attracts two or three bidders, which is substantially fewer than in for example the British railway market.

The current model of public procurement in the Swedish railway industry is a kind of hybrid between a beauty contest and a reverse closed auction in which the lowest bid wins. The bid price is always very important, but generally the bidder also has to meet other criteria, showing that it conforms to standards on competence and is prepared to work with quality-related issues. Within this framework, two main alternative types of contracts are in use. For local and regional services, *gross cost* contracts are generally applied, implying that the winning bidder gets compensation for its costs of operation, while revenues from ticket fares accrue to the procuring authority. For long-distance services, a *net cost* approach is used, meaning that the operator, apart from the subsidy in accordance with its bid, also gets the income from ticket sales. In these contracts, the operator may influence the price of tickets at least to some extent. The net cost procurement of passenger rail services therefore resembles a common value auction, in which the participating bidders value the prospects differently, for instance based upon different expectations of patronage development. Since a procurement of a net cost contract means that the bidder must calculate both future revenues and costs, it implies a higher degree of risk taking for the bidder than the gross cost contracts normally in use for local and regional services.

In the net cost tenders of the inter-regional services, Rikstrafiken evaluates the bidders by means of a number of parameters in addition to the bid price. The criteria relate to competence, the supply and quality of the proposed services, and also the proposed ticket prices. In 2002, Riksrevisionsverket (the Swedish National Audit Office) pointed at several problems concerning these procurement procedures, for example the lack of specified weights for each of the multiple criteria. In a later investigation, Statskontoret, the Swedish Agency for Public Management, found that Rikstrafiken had improved on this point, but criticized the authority for the absence of strategic and operational goals and the lack of resources for monitoring and controlling tendered services. Statskontoret (2003) also pointed at remaining problems with having a sufficiently competent staff for evaluating bids and performing other tasks.

4. The case of the tender for train services to northern Sweden

4.1. The tendering process and its legal consequences

On the 25th of June 2002, the procuring authority Rikstrafiken decided that the company Connex had won the tender for a net cost contract of operating the night trains to

[16] A description of this development is presented in Nilsson (1995), and Alexandersson and Hultén (1999).

northern Sweden, regarding a period of five years beginning in June 2003. The outcome of the tender was determined by the large difference (on average 42% for the whole period) between Connex' bid and the bid of the incumbent operator Tågkompaniet (Rikstrafiken, 2002b).

Connex, originating from France, is Europe's biggest private passenger transportation company, having 55.000 employees and an annual turnover of 3.4 billion Euro.[17] The company has successfully entered several European countries following the opening of national railway markets to competition, but has also experienced several problems fulfilling its commitments.[18] In France, the company has not yet had to encounter any foreign competitors.

Three former executives from the national operator SJ formed Tågkompaniet in early 1999. The company very soon became successful in several tenders, beginning with the important contract for the trains to Northern Sweden, taking over operations from SJ in January 2000. Building up the company from scratch, the management followed a strategy of minimizing overhead costs and using external suppliers for all things that were not considered strategically important.

Following the decision of Rikstrafiken in June 2002, Tågkompaniet faced a clear risk of being dismantled altogether, since these tendered services made up 80% of its business. The company's management reacted by reporting the tender to the county court of Västernorrland. Among other things, it was claimed that the bid from Connex was "totally unrealistic" and had to be based upon price dumping (Gärde Wesslau Advokatbyrå, 2002a, p. 2). The court decided to temporarily stop Rikstrafiken from completing the tender, thereby preventing the signing of a contract with Connex (Länsrätten i Västernorrlands län, 2002). Rikstrafiken (2002d) replied in a writ to the court that Connex, upon request had presented satisfactory explanations for the low bid. Tågkompaniet responded by accusing Rikstrafiken to have given up the basic preconditions in its invitation when accepting several reservations in Connex' bid (Gärde Wesslau Advokatbyrå, 2002b). Rikstrafiken (2002e) replied that Connex had accepted the basic conditions and had made elucidations, interpreted by the authority as if Connex would bear any risk if "the calculation prerequisites" would deviate from the basic demands. In a final plea, Tågkompaniet demanded that Connex' bid was rejected as unreasonably low or that a new tender was performed. The company continued to claim that Rikstrafiken had failed to act in accordance with LPP when it accepted Connex' calculation prerequisites and that Connex had not presented a satisfactory explanation for the low bid (Gärde Wesslau Advokatbyrå, 2002c). However, in late August 2002 the county court decided (without trial) to give Rikstrafiken clearance for

[17] The figures refer to the whole Connex group, operating in Europe, North and South America, the Middle East and Australia (Connex, 2003b). Connex Sweden (previously Linjebuss) is a part of Connex Transport, a subsidiary responsible for the contracted services in Northern and Eastern Europe. Connex Transport has about 18.000 employees and an annual turnover of about 760 million Euro (Connex, 2003c).

[18] In November 2003, the Strategic Rail Authority (SRA) forced Connex to leave its U.K. franchise on South Eastern Trains prematurely. This action followed Connex' failure to live up to conditions linked to an agreement on SRA payments of additional subsidies in 2002, corresponding to a doubling compared to the contracted level (Strategic Rail Authority, 2003). In Germany, Connex discontinued one of its non-subsidized long-distance lines (Rostock-Berlin-Cologne) in October 2003 after five months due to lower demand than expected. Likewise, according to Die Bahn (2004, pp. 11–12), its winning bid for the Hamburg-Westerland route appears to be based on unrealistically high expectations of fare revenues.

signing a contract with Connex, which then took place in mid September (TT, 2002; Dagens Nyheter, 2002). In parallel to this process, Tågkompaniet also tried to get the Swedish Competition Authority to take action. The company argued that Connex' bid was based upon information produced by means of a prohibited co-operation between SJ and Connex in a tender for the same services in 2001. SJ and Connex had then placed a joint bid, but Rikstrafiken chose not to complete that tender, with reference to unclear legal circumstances (Rikstrafiken, 2001). In October 2002, the Competition Authority decided not to take action, after failing to find sufficient support to investigate any possible violation of the Competition Act (Konkurrensverket, 2002).

When Rikstrafiken and Connex had signed the contract, the tender could no longer be tried in the county court. Instead, Tågkompaniet started to prepare for suing the state in a local court, based upon its view that Rikstrafiken had made several formal faults during the tendering process and that Connex' bid should have been rejected since price dumping had occurred. In June 2003, Tågkompaniet revealed that its demands amounted to SEK 53 million, equaling the lost expected profits during the contract period 2003–2008 (Dagens Nyheter, 2003).[19] By this time, it had also become clear that Tågkompaniet would survive the loss of its main business, sticking to its few other contracts and seeking co-operation with Danish State Railways (DSB).

4.2. Assessing the bid—introductory remarks

The legal consequences after the tender have not resulted in an actual trial of whether or not Connex' bid is "unreasonably low".[20] In our opinion, the question is of such importance for future tenders of train services and other goods and services, that a thorough analysis is called for. Therefore, based upon accessible information, we have made our own assessment of the reasonableness of Connex' bid. As previously cited cases have shown (and not least the view of NOU), such an assessment must begin with the conditions specified in the procuring entity's invitation to tender. The first question to ask, therefore, is whether this invitation allows very low bids, for example due to price dumping, to be accepted.

In its invitation, Rikstrafiken has specified the circumstances of guidance for the tender. Under the headline "The procurer's objectives" it is declared that [our translation]:

> "The overall objective for the transportation policy is to secure a socio-economically efficient and long-term sustainable provision of transportation for the citizens and industry all over the country."[21]

How does this conform to bids that are explained by price dumping or cross-subsidization? Accepting such bids may lead to an unsatisfactory allocation of resources both statically and dynamically, because the winning firm is not selected on the basis of its efficiency. This may result in the exit of another, possibly more efficient

[19] These demands appear to be rather modest, taking previous court rulings into account. Damages may amount to as much as the total contract sum for the whole contract period (see e.g. Lex Press, 1999).

[20] Following Tågkompaniet's sue for damages, a trial was likely to begin in early 2005. As described in the Post Scriptum, the case was eventually settled outside court. It is unclear what aspects of the tender that would have been considered by the court.

[21] Rikstrafiken (2002a, appendix 1, p. 1).

firm, which would have been able to offer the service at a sustainable price level. Moreover, there is a risk that the chosen bidder will not be able to fulfil its obligations, which will also have negative socio-economic effects. Consequently, we argue that a public agency that seeks socio-economic efficiency, such as Rikstrafiken, should reject bids as "unreasonably low" if they are based upon price dumping or cross-subsidization. To decide if this is the case, the agency should conduct an evaluation of the cost structure of the bid.

Rikstrafiken's tender for the train services to northern Sweden is a tender for a net cost contract, i.e. the bidder must calculate both future revenues and costs. The difference between these values (with addition of the calculated profit) results in the bid of asked subsidies from the bidder.

Tågkompaniet started to run the services in January 2000, receiving an annual subsidy of (on average) SEK 114 million. When SJ operated the traffic in 1999 it cost the state close to SEK 144 million per year.[22] SJ did not place any bid in the latest tender, making it the first tender of some importance without SJ's participation.

Connex demands an annual subsidy of 62 million SEK on average during the five-year-contract period, while Tågkompaniet believes that 107 million is necessary (Rikstrafiken, 2002c). Compared to the 105-million-subsidy to Tågkompaniet in 2002/03, preceding the new contract period, Connex' bid implies a decrease of the annual subsidy by 43 million SEK on average. This is the starting point of the upcoming analysis.

4.3. Costs, revenues and subsidies in detail

In order to do a detailed comparison of the calculations of Tågkompaniet and Connex, it is necessary to make their differences clear regarding the views on the development of revenues and costs. Tågkompaniet has published the firm's prognosis for revenues and costs over the contract period, forming the basis for its bid. For Connex' part, we have made estimations based upon assumptions and Rikstrafiken's presented information on the company's explanations.

The starting point for our calculations is the available information on the train services right before the new contract period. It is assumed that Tågkompaniet's prognosis for the traffic year 2002/03 is a good approximation of this situation. The forecasted costs and revenues this year are presented in Table 1, as well as the state subsidy. The forecasted profit was 11.7 million SEK.

In order to estimate Connex' forecast on revenues we have used the information from Rikstrafiken (2002e, p. 3) that Connex expects an annual 2% increase in revenues. For the estimation of the forecasted cost development we make two assumptions. Firstly, every year's decrease in the amount of subsidy needed must be fully covered by larger revenues and/or cost cuts during the same year. Secondly, we assume that Connex calculates with the same average profit margin (2.7%) as Tågkompaniet.[23]

[22] The data originates from *Delegationen för statens köp av viss kollektivtrafik* (Committee for the state's procurement of certain public transport) and the bid from Tågkompaniet.

[23] The profit margin of Tågkompaniet was calculated as follows: the total revenue for the five-year contract period is the sum of all revenues and all demanded subsidies. When the sum of all costs for the period is subtracted from this total revenue we get the total five-year profit. This total profit is then divided by the

Table 1 Comparison of the bids of Tågkompaniet and Connex (million SEK)

	Traffic year	02/03	03/04	04/05	05/06	06/07	07/08
Tågkompaniet	Cost forecast	346	356	365	384	396	407
	Revenue forecast	253	264	272	281	296	312
	State subsidy	105	105	105	114	109	104
Connex	Cost forecast		324	319	320	320	325
	Revenue forecast		258	263	268	274	279
	State subsidy		75	65	60	55	55

Sources: Rikstrafiken (2002c, 2002e), Tågkompaniet (2002) and own calculations.

The data from Tågkompaniet and the results of the calculations regarding Connex are presented in Table 1. A first observation to be made is that Connex' forecast on the development of revenues is rather modest compared to the one of Tågkompaniet. The biggest difference between the bids relates to the forecasted costs. While Tågkompaniet appears to assume that the development of costs is closely linked to the revenues, Connex believes that it is possible to immediately cut costs to a lower level, and keep them relatively stable for the rest of the contract period. Thereby, Connex may demand substantially lower subsidies already in the first year of the contract period.

In short, the calculations show that of the decrease in annual subsidy of SEK 43 million (on average) that Connex' bid comprises, higher revenues may explain 15.6 million, while 24.7 million must be achieved through lower costs.[24] Even if the already low profit margin is reduced to zero, it would be necessary for Connex to save almost 16 million SEK.

How will Connex achieve these cost savings? Experiences have shown that many costs are impossible for the railway operator to influence, since there is only one supplier of certain services.[25] The charges for renting vehicles are fixed by a contract between SJ and Rikstrafiken; maintenance may only be performed by a special workshop; Banverket sets the track fees, and the energy costs depend upon current prices on the electricity market. Connex has also publicly declared that it will not cut down on staff or change the working conditions (Connex 2002b, 2003a). With this in mind, practically the only remaining things to consider are the costs for selling tickets, serving meals onboard, cleaning and some minor "other" costs. For these things, Tågkompaniet calculates that costs will increase from SEK 108 million in 2002/03 to (on average) 114 million during the contract period. Connex therefore has a need to save on average 25 million on things that cost 108 million (a 21% decrease), provided that the parts of the costs that are difficult or impossible to influence are kept unchanged (but for which Tågkompaniet also calculates on increased costs).

total revenue to get the profit margin (2.7 percent) for the period, which may also be seen as a (weighted) annual average. The data necessary for this type of calculation is available in Table 1, but since they are represented by approximate values (no decimals) the result will be slightly higher (2.8 percent).

[24] The rest, 2.7 million SEK, relates to a decrease in projected profits (coming out as a residual value in our calculations).

[25] Mikael Prenler, former director at *Delegationen för köp av viss kollektivtrafik* claims this in Gärde & Wesslau Advokatbyrå (2002c, Appendix 4).

The cost calculation of Connex becomes especially remarkable when taking into account that the company simultaneously expects increased revenues, regardless of their modest magnitude. This is because the increase in revenues will not be possible to obtain primarily through higher ticket prices, since Rikstrafiken gave Connex and Tågkompaniet the same evaluation marks for the ticket price level (Rikstrafiken, 2002c). Instead, increased travelling is needed. This increase must be obtained without additional expenditure on marketing or sale of tickets—on the contrary large savings must be achieved on precisely these parts of the business. In comparison, Tågkompaniet assumes that increased travelling will translate into a demand for additional trains and lead to increased costs in all areas.

One circumstance that makes Connex' bid difficult to evaluate, is the fact that it is based upon what Connex calls [in our translation] "assumptions making up prerequisites for the calculated compensation and prices" (Connex, 2002a, p. 3). Although the complete bid has not been made public, these passages appeared during the county court's handling of the case. Among Connex' "assumptions" it should be noted that the company has chosen not to account for that some vehicles need to go through expanded maintenance during the contract period, assumes that track maintenance of some scale must not affect revenues substantially, and expects that no local deals above central agreements will lead to increased staffing costs (Connex, 2002a, p. 3). Rikstrafiken has chosen to call these assumptions "calculation prerequisites", arguing that in case they actually would lead to a deviation from the basic conditions of the tender, Connex alone bears the risk (Rikstrafiken, 2002e, p. 2). However, Connex has not officially declared that the company shares this view. Tågkompaniet was not given the opportunity to make the same reservations, and has calculated that Connex' assumptions correspond to about SEK 29 million annually in lower costs (Gärde Wesslau Advokatbyrå, 2002c, p. 15).

The analysis of the differences between the forecasts behind the bids can only lead to the conclusion that Connex' bid will result in losses and violate the clause on socio-economic concern in the invitation to tender. In addition to this first type of evaluation, we will also present an alternative method. It is based upon information on previous tenders in the Swedish railway sector.

4.4. What do previous tenders of train services show?

The studying of historical data on previous tenders should provide some guidance and rules of thumb that may help a procuring entity reveal the existence of abnormally low bids. Already today, rules of thumb play an important role in both European and American competition law, and may often be traced back directly to related theoretical and applied research (see for example Niels and Ten Kate, 2000; Grout, 2000). In order to judge Connex' bid, we will consider the economic results of the train operators winning gross or net cost contracts in Swedish tenders during the past 15 years.[26]

Tenders of gross cost contracts for train services may be divided into two groups: contracts implying a profit for the winning bidder, and contracts resulting in losses. The

[26] The data has been collected through direct contacts with traffic authorities and the predecessors to Rikstrafiken, i.e. *Förhandlaren för statens köp av persontrafik på järnväg* and *Delegationen för köp av viss kollektivtrafik.*

first time specific traffic is put out to tender, a large reduction in subsidies is generally achieved. Later tenders will typically lead to minor savings. Historically, a critical limit seems to occur when cost savings have amounted to 20%. BK Tåg successfully managed to cut subsidies by more than 20% for the regional services of *Länstågen* in the Swedish counties of Jönköping and Halland, following the first tender in 1989. One important explanation was that the company succeeded in expanding the tasks performed by the drivers and altered their schedules. This resulted in considerably lower costs compared to the previous situation. Thereafter, two other operators, first SJ and later BSM Järnväg, have failed to bring down subsidies even further, to a level 40% below the starting point. During the legal process following BK Tåg's loss of the contract in the second tender, SJ had to admit that costs were higher than included in its winning bid. BSM Järnväg won the contract in the third tender with a bid somewhat higher than SJ's, but it nevertheless turned out to be unprofitable. The latest (fourth) tender resulted in substantially higher costs for the procuring authority, although a direct comparison with previous years is impossible to perform due to changed conditions in terms of supply and rolling stock.

Another case of a tender resulting in large reductions of the public subsidies, but leading to losses for the train operator, is the first tender for the *commuter trains* of Stockholm. The county council enjoyed lower costs in the magnitude of SEK 300 million annually, corresponding to about 32%. But the winning bid from Citypendeln turned out to be based upon unrealistic assumptions regarding the possibility of changing the working conditions of the train drivers. Considerable disruptions in the services occurred when the shift of contractor took place, and several problems remained for almost a year. The fact that the contract included far-reaching terms on quality of deliverance linked to penalty payments did nothing to improve the situation. It was impossible for the procuring authority to monitor all the problems, and the penalty system was not designed to handle a total breakdown of the services. Citypendeln's losses amounted to 29 million SEK in 2000 and 67 million SEK in 2001, (Citypendeln, 2002).

The tenders for the train services on *Västerdalarna Line*, *Österlenaren*, *Kinnekulle Line* and *Upptåget* have resulted in contracts on reasonable levels, i.e. the subsidies paid by the procuring entities have been pushed down, but not to the point that train operators are losing money. In the cases of Västerdalarna Line and Österlenaren, the operators winning the first round of tendering (BK Tåg and Sydtåg, respectively) were able to take advantage of limiting the size of the work force, specializing in driving only the services in question. Sydtåg did go bankrupt before the contract period ended, but this was due to problems related to the firm's freight services rather than the passenger services. Kinnekulle Line has been put out to tender three times. After several years of short-term extensions of the contract (with negative economic effects for the operator BK Tåg), the latest tender resulted in a slight increase in subsidies (with adjustment for the fact that the contract was turned into a net cost contract) when Connex took over in June 2003 (Västtrafik, 2002).

The tenders concerning net cost contracts are harder to divide into groups, partly because there are fewer examples available for comparison over time. The possibilities for the train operator also to influence ticket revenues appear to make larger reductions of subsidies feasible, or at least make some bidders believe so. The *West Coast Line* is an extreme case. The companies behind Sydvästen, the firm that won the tender for

the services of the year 2000 with a radical zero-subsidy bid, assumed that it would be easy to increase travelling and find many additional premium customers by means of a higher service level. Sydvästen both succeeded and failed with its intentions. The number of passengers increased, but most of them did not generate any additional revenues—people only started to use their already purchased travel cards (issued by the traffic authorities) more frequently. Therefore, the calculation did not hold, and the company went bankrupt after only four months.[27]

In the third tender for *Vättertåg*, BSM Järnväg came out as the winner, with a bid that was more than 35% lower than the subsidy before the first tender, and substantially lower than SJ's winning bids in previous tenders. BSM's bid turned out not to be profitable, and when the contract period ended, the firm chose not to use the option for a prolongation. At short notice, Rikstrafiken was therefore forced to organize a new tender.

A package of lines in *Bergslagen* has been won by SJ in all tenders. Actual competition in the first two tenders initially resulted in a reduction of subsidies by more than 20%, followed by a period of stability as competition became weaker. A fourth tender preceded a substantial expansion of the services from 2001, coupled with the introduction of new trains. SJ won this tender with a low bid, turning out to be a source of annual losses of SEK 100 million for the firm (Trafik Forum, 2003, p. 32). SJ has then pushed for modified contract conditions, including threats to terminate the contract prematurely.

The train services to the northern part of Sweden have not experienced any substantial benefits from important innovations related to the rolling stock. Likewise, the limited track investments have not resulted in major gains of travel time. The first competitive tender (regarding the traffic year 1993/94) reduced the state's subsidy by almost 20%, although SJ continued as the operator. Corresponding reductions were achieved on the other tendered lines this year (all of them won by SJ). One explanation is that SJ adapted its demanded level of compensation, following a sensed real threat of entry from new competitors. In the next tenders, actual competition for these services weakened, and the state's subsidies tended to increase. However, the tender resulting in the entry of Tågkompaniet led to a substantial reduction of the subsidies, initially about 20% (or 25% below SJ's original level in 1992). This was possible by means of a number of actions. One important change was that the company reduced the number of passengers travelling for free (e.g. former SJ employees), a group that used to be so large that it may have crowded out the paying passengers. Moreover, service levels were improved, and Tågkompaniet also strengthened the co-operation with tourism organizations. During 2001–2002, the subsidies to the company increased (following renegotiations rather than proper tenders), partly to compensate for higher track fees. On average, the subsidies to Tågkompaniet were about 21% lower than during SJ's final year.

[27] There were also other factors that contributed to this rapid development. For instance, only a couple of days after Sydvästen had started its services, the Government decided that SJ would get back the traffic directly after the end of the one-year contract, without having to win a new tender. When the bid was placed, Sydvästen assumed that the services would continue to be tendered. The changed conditions made it pointless for the company to endure the whole contract period once the economic problems had become apparent.

In view of these experiences from previous tenders of Swedish rail services, let us have another look at Connex' bid. It implies that subsidies are reduced by 42% (or more than 45% below Tågkompaniet's average level for the past years), while Tågkompaniet's calculations assume a more or less unchanged need for subsidies. When compared to the historical data, it becomes clear that no bids promising subsidy reductions similar to those of Connex, have been possible to carry out without losses for the train operator. This has not even been possible when train services are tendered for the very first time, and this case refers to services that have already been tendered six times—at least twice with evident competition between several bidders.

The study of historical data leads to the same conclusion as the detailed analysis of forecasts for the development of costs and revenues: Connex' bid is extremely low. It would be possible to explain by means of a radical cost reducing reorganization of the business, but any signs that this is the case have yet to appear.

5. Conclusions

Public procurement by competitive tendering is growing in importance, not least in Europe. When used successfully, it tends to increase competition, inducing efficiency gains and structural changes that revitalize sectors long curbed by national monopolies. However, the occurrence of predatory bidding and other questionable bidding practices may undermine the positive effects of competitive tendering.

Like predatory pricing, predatory bidding may be hard to detect and separate from fierce but legitimate price competition. In order to illustrate the possible options in situations with limited access to data, and the applicability of the current legal framework, we have taken a closer look into one specific case, the tender for the passenger trains to northern Sweden.

As follows from our two types of analyses, it is likely that Connex' bid in this tender is based upon unrealistic assumptions, price dumping and/or cross-subsidization. There is also a risk that the company will ask for more compensation if the "calculation prerequisites" are not met.

How can we characterize Connex' bid? A benevolent interpretation is that it is based upon faulty calculations, due to carelessness or ignorance. Drawing on examples from its operations in other European countries, Connex has had some problems fulfilling its obligations that may be explained by faulty calculations or unrealistic expectations. This would lead us to consider if it is reasonable to demand that a company like Connex places a realistic bid. In the court's decision concerning the case of SJ's pricing below cost in a tender for regional services, it was claimed that SJ in its calculation of costs should be expected to have "performed a reasonably thorough and realistic calculation" Marknadsdomstolen (2000, p. 23). In our view, there is no reason for having lower demands on Connex' forecast on costs and revenues.

Modern economic theory stresses the importance of what signals a firm transmits and how they influence inter-firm relationships. One way to look upon Connex' bid is to consider it to be a clear signal to present and future competitors that the firm from now on views the train services to northern Sweden as its own business. SJ seems to have accepted this, demonstrated by the fact that the firm did not even place a bid in

the latest tender.[28] Although Connex' bid appears to have been predatory by intention, it did not actually destroy Tågkompaniet, since the firm managed to survive by means of other contracts.

How was the bidding process carried out as regards the law? It is clear that the tender of the trains to northern Sweden has put the procuring authority Rikstrafiken—facing criticism and legal actions—in a very delicate situation. Even in the case of a successful implementation of Connex' bid, some parts of the critique will remain valid. Firstly, Rikstrafiken should clearly have motivated *why* it considered Connex' bid not to be "unreasonably low". The authority confined itself to declare this view (after having received explanations from Connex). Rikstrafiken did not discuss the risk of Connex dumping prices or cross-subsidizing the train services—practices that should not be allowed following the demands for socio-economic efficiency stipulated by the authority itself. Secondly, the authority accepted bids bearing such differences that they appear difficult to compare. We here refer to what Rikstrafiken calls "calculation prerequisites" in Connex' bid. Resembling restrictions, they should at least have resulted in a new resetting of the bids. The contract bears the risk of turning into a very costly deal for Rikstrafiken and for the state. In the worst case, Rikstrafiken may have to cover the additional costs due to changed prerequisites, and also pay damages to Tågkompaniet. Although this company only asks for a small amount, previous court rulings suggest that considerably higher amounts are possible. All in all, Rikstrafiken should reconsider its routines for procurement, further emphasized by the fact that two authorities (Riksrevisionsverket and Statskontoret) have criticized Rikstrafiken after previous tenders.

Procuring entities already need to acquire considerable knowledge on the goods and services that they are expected to purchase. Our analysis of historical data is a first step towards rules of thumb, showing when it is justified to thoroughly consider whether a bid is reasonable or not. Perhaps, there is also a need for complementary changes in the model of procurement. We have identified the case in question as a hybrid between a beauty contest and a reversed closed auction. Experiences from auction theory on alternative practices may therefore be of use, although it is probably difficult to eliminate the presence of abnormally low bids entirely. In addition, theoretical auction models need some revision in order to become usable in practical decision making (Rothkopf and Harstad, 1994).

The case of the northern train services shows a number of problems with today's legislation and regulations concerning competitive tendering. Overall, there is very little attention paid to the risks of disturbance and disruption of delivery connected to low bids in tenders, despite the negative effects on the end consumers of certain goods and services. More specifically, the Swedish Competition Act (based upon EU legislation) is unsatisfactory for dealing with large international firms winning competitive tenders with aggressive bids in the Swedish market, due to the limitations of the concept "relevant market". By use of complementary market definitions—the

[28] It may be argued that an alternative explanation to SJ's decision not to place any bid of its own would be that the company considered that it could not compete with the existing operator. Although this is possible, one should consider the fact that this was the first occasion SJ acted like this. It also happened right after a joint bid of SJ and Connex had caused Rikstrafiken to abort the previous tendering procedure for the same services.

national market and the international—it may be possible to reduce the risk of predatory bidding in competitive tenders. Judgments on the relevant market and the related market power of firms should be made on a case by case basis. The existing interpretations of the Competition Act, as expressed by the Swedish Competition Authority, Swedish Courts of Law and EU institutions, only look at the market power in a regional Swedish market or in the national Swedish market for a defined product or service. This interpretation limits the actions of the incumbent Swedish former monopolist and oligopolists, but puts no restrictions on the competitive behavior of multinational firms that are often substantially bigger than the Swedish players. We suggest that both these categories of firms can be regarded as dominant firms in competitive tenders for railway passenger services—for two reasons: (1) they have a substantial market power in the relevant multi-layered (regional, national and European) market context, and (2) they can benefit from a predatory bid by reducing competition in the future, since a competitive tender for a railway contract results in a winner-takes-all situation which can drive out a competitor from the market.

The analysis and discussion above leads us to the conclusion that there is a need for a Swedish re-interpretation of the law on public procurement and of the Competition Act. Similar measures may be applicable in other (especially small) EU countries that introduce competitive tendering in public transportation. Within the framework of EU regulations, the legislation and related instructions should provide better guidance to the procuring entities as well as to the Competition Authority. Current work on new EU-wide guidelines for the interpretation of Article 82 (abuse of dominant position) seems to be in line with at least some of the points raised here. For example, a recent report to the European Commission argues for an effects-based approach to competition policy, focusing on the examination of each specific case and "the presence of anti-competitive effects that harm consumers" (EAGCP 2005, p. 2). This would also put less emphasis on defining market boundaries and dominance.

Postscript

Since this article was originally submitted, a couple of things related to the case have happened. We will describe and comment upon these briefly.

In July 2004 it became apparent that Rikstrafiken needed to save money on all its tendered services, following some tendered contracts for airline services that had become way too costly. After negotiations, Rikstrafiken and Connex closed a deal meaning that one of the three daily departures was to be withdrawn in January 2005. The change also implied that the connections from Gothenburg in the south were rerouted via Stockholm (increasing travel time) and that some cities in the north were no longer to be served at all by the trains (Norrbottenskuriren, 2004a).

During the autumn 2004, the services of Connex were criticized for bad punctuality and cleaning, but foremost for being run by old and very run-down trains lacking the comfort passengers expected. Connex appeared not to be willing or able to keep the interior of the trains in good shape. Patronage plummeted and in late 2004 the management of Connex was facing massive criticism from staff and union. The head of the services was replaced (Norrbottenskuriren, 2004b, 2004c).

The step-wise process of worsened conditions for traveling by train between Stockholm and Northern Sweden (and elsewhere) now caused a political debate that soon reached the national level. The end result was a decision in Parliament in 2005 to direct an extra 100 million SEK per year to Rikstrafiken, making it possible to keep or improve the level of supply and standard on all tendered train services. A special programme of vehicle renewal was also initiated.

Earlier the same year (in January) the dispute between Rikstrafiken and Tågkompaniet was finally settled outside the court (until then, the trial had been delayed several times). Rikstrafiken publicly admitted that the tender was badly performed and agreed to pay Tågkompaniet the symbolic amount of 500.000 SEK in damages (Rikstrafiken, 2005, Norrbottenskuriren, 2005).

All in all, this chain of events makes it pretty clear that the bid of Connex was not possible to fulfill. Interestingly enough, Connex has been able to make the state increase the amount of taxpayers' money spent on the services in order to maintain an acceptable vehicle standard. It is also likely that Connex has been able to achieve some net gains from the reduced number of train services.

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Essay 6

High and Low Bids in Tenders:
Strategic Pricing and Other Bidding Behaviour in Public Tenders of Passenger Railway Services

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HIGH AND LOW BIDS IN TENDERS: STRATEGIC PRICING AND OTHER BIDDING BEHAVIOUR IN PUBLIC TENDERS OF PASSENGER RAILWAY SERVICES

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ABSTRACT:** *An important component in the deregulation of the public sector in the European Union is public procurement of services and products. This article studies the bidding behaviour of firms participating in public tenders of passenger railway services in Sweden. In a theoretical part of the article we discuss the various possible reasons behind high and low bids in tenders, linked to a discussion on pricing strategies and continuous and discontinuous economies of scale regarding costs of production. Detailed data on bids and bidders in Swedish tenders of railway services are then analyzed. 37 tenders taking place between 1989 and 2005 are included.*

1 Introduction: the research problem

An important component in the deregulation of the public sector in the European Union is public procurement of services and products by competitive tendering. The Community legislation on

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** *Résumé en fin d'article; Zusammenfassung am Ende des Artikels; resumen al fin del artículo.*

public procurement aims at reducing costs for contracting authorities, increasing intra-Community competition in key industries, and permitting competitive European firms to develop.

This article studies the bidding behaviour in public tenders of passenger railway services in Sweden. In these tenders, competing firms place bids on the amounts of subsidies needed to operate the services. The aim of the article is to research if some firms may use their pricing of bids in a strategic way. Our principal hypothesis is that a large oligopolistic firm by placing either a very low or a very high bid signals to its competitors that it is interested in a market (and seeks to capture it) or less interested in it, respectively. Another hypothesis is that regional publicly owned firms place relatively low bids, benefiting from a hidden tax subsidy. We also conjecture that small firms will normally refrain from strategic pricing below costs because of a lack of financial resources, and likewise avoid strategic pricing above costs because of the effort and costs of preparing and submitting a bid.

The article also aims at investigating and categorizing other possible reasons for high and low bids in tenders, and to study the impact on the spread of bids from such factors as the size of the traffic tendered, the number of bidders and the maturity of the market.

To seek evidence for the existence of very low and very high bids in tenders, and the possibility of strategic pricing, we use a data set of Swedish public tenders for passenger railway services during the last 15 years. One methodological problem in the study is that many contracts have only been subjected to public tendering on one occasion. Another methodological problem is that the size of the contracts varies a lot. A third factor is that the uncertainty about costs and revenues tend to be higher the first time a railway service is tendered. A fourth factor is the lack of tenders involving more than two known bidders. All these factors need to be considered in the evaluation of the results.

2 The market for procured passenger railway services in Sweden

Following a step-by-step process that may be traced back to the 1960s, the Swedish railway sector has gradually been transformed from a vertically and horizontally integrated monopoly to an industry

characterized by decentralization and multiple suppliers of railway operations and supporting services.[1]

The first Swedish tenders of passenger railway services took place in 1989–1990. These tenders were a direct result of two inter-related reforms of 1988: the vertical separation of railway infrastructure from operations, and the transfer of responsibility for the unprofitable local and regional lines to the county public transport authorities. Consequently, the first tenders concerned local and regional lines, resulting in BK Tåg becoming the first new entrant in 1990. For the first time in over 40 years, the state-owned incumbent SJ faced competition from another railway operator.

Drawing from the positive experiences of competitive tendering of local railway services, tenders were also introduced for subsidized inter-regional services from 1993. While the local tenders were for gross-cost contracts, i.e. the operator got no revenues from ticket sales, the tenders of inter-regional services presupposed net cost contracts. Moreover, in order to get access to several common functions and to necessary rolling stock, the new operators bidding for these contracts had to reach an agreement with the former monopolist, SJ. For several years, these tenders involved much negotiation and whenever competitors appeared, SJ commonly reduced its own bid during this process in order to keep other operators from entering the market. It took until 1999 before other firms were able to win these contracts. By that time, several of the railways' common functions had been removed from SJ and a proper price-list of vehicles had been established by the procuring authority and the government.

The Swedish State continues to play a predominant role in the passenger railway sector. It still controls and maintains the railway infrastructure, by means of the authority Banverket, and is the owner of the most important railway operator SJ. The Swedish State also owns Jernhusen that manages the most important railway stations and Euromaint that is the dominant actor in the market for passenger train maintenance.[2] SJ continues to have a monopoly on the so-called profitable passenger lines, i.e. the important trunk lines between Stockholm and major cities like Gothenburg, Malmoe,

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[1] A detailed description of this development is presented in Alexandersson et al. (2000) (in Swedish). A condensed version in English is available in Alexandersson and Hultén (1999).

[2] The Swedish State also controls Green Cargo that is the dominant player in the railway freight market, and Swemaint that carries out maintenance work on freight wagons.

Karlstad and Sundsvall. All subsidized lines are tendered by either regional authorities or the national authority Rikstrafiken. Some old long-term contracts between local authorities and SJ remain, but eventually these will probably be tendered as well. Since 1990, a total of eight new railway operators have entered the Swedish market for passenger railway services. Of these, five remained as independent actors alongside SJ in 2006: Connex, Keolis, Tågkompaniet, A-Train and the Danish National railway operator (DSB). Arriva is set to enter in 2007. The few CPTA-owned operators that were active in some tenders in the 1990s have disappeared from the market.

Sweden has been a member of the European Union since 1995. The most direct consequence for the railway sector is probably that the regulations on public procurement and competition have become stricter and more formalized (a process initiated already with the implementation of the EES treaty in 1994). In other respects, the Swedish railway deregulation process has been pushed forward almost entirely for domestic reasons, rather than as adjustments to comply with European Union directives and policies.

3 Public tenders of railway services – some characteristics

Public procurement of public transport services entails some specific circumstances that are rarely observed in ordinary markets. The procuring entity has a strong position as a buyer, sometimes close to a monopsonist. Its purchases and buying behaviour determine the range and limits of the actual market. A firm that wins a contract gets to deliver the service and the end consumers are bound to use the supplier chosen by the procuring entity. Although enjoying a monopoly-like position during the contract period, the contractor's actual powers are often restricted, for example in terms of the possibilities to influence ticket prices and supply.[3]

Public procurement also means that actual competition between firms for a specific part of the market only takes place at discreet points in time, often with several years in between. This affects the possibilities for survival and growth facing the sellers in the industry, and thereby the competitive landscape, over time. Even if other public tenders, concerning other parts of the market, may happen during these years, a loss in a tender that represents a major part in a

[3] Similar observations on public procurement characteristics have been made by Sorana (2000).

firm's business may ultimately lead to the dismantling of the firm altogether. This is an indirect effect of the need for subsidies to run railway passenger traffic in the competitive part of the Swedish railway network. The only way to get access to such a line or a regional network is by winning a tender. As a consequence, a firm that has lost a contract cannot use the assets needed for other railway operations and therefore has to either hand them over to the firm winning the tender or abandon them. It may be argued that firms that are efficient in the long run would always have the alternative to borrow money to stay afloat until another tender comes along. However, this option does not seem to be realistic in situations when firms may need to survive long periods of no or much reduced business activity, with only a chance (not certainty) to win a future tender.[4]

A firm that wins a contract in the passenger railway market may become the only supplier for as long as seven years in Sweden compared to up to fifteen years in Great Britain. Contracts are regularly prolonged with a couple of years. Once the contract has been signed there may also be some possibilities for the winning firm to renegotiate the contract (developed further below). These circumstances, and the fact that firms that don't win a contract sometimes leave the market altogether, may give the incumbent firm a substantial advantage in later public tenders. Hence, in the public procurement market for passenger railway services it can be more advantageous than in other competitive markets to become an incumbent.

The conditions stipulated in the procuring authority's invitation to tender form the basis for a firm's bid calculation. The invitation defines the type and amount of traffic that is to be produced, and a number of characteristics and demands related to the rolling stock, maintenance, performance and quality. Although the specific demands differ from tender to tender, they generally define the minimum standard of the traffic. Depending on the type of contract tendered – gross cost contracts or net cost contracts (where ticket revenues also become an important source of the operator's income) – the bidder may be more or less inclined to offer a service level or standard above the minimum requirements. Promising higher quality may result in a more favourable evaluation from the procurer, and possibly also increased travelling and ticket revenues.

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[4] Eckert (2002) discusses the importance of speed of antitrust actions in order to avoid these types of problems.

Based upon how much and what traffic that is to be produced, the bidder has to combine a set of inputs to construct its bid. Among the many questions to be answered are: What type of rolling stock is needed? Should it be rented or bought? How much maintenance is expected and where to get it? How much personnel is needed and on what positions? What are the costs of electricity (or other types of fuel), track access fees, cleaning, marketing and (when applicable) administration of ticket sales? In addition to this, possible revenues from ticket sales must be calculated in bids for net cost contracts, based upon projections on the development of demand. In many ways, calculating a bid in a tender for train services is similar to planning a start-up of a new business operation from scratch. It is difficult to get the true prices of all the factors of production beforehand. The impact of unexpected events and breakdowns must also be taken into account, influencing the need for spare vehicles and alternative ways of transportation, e.g. buses.

The resulting bid is not only a specified price, but also a presentation of how the bidder intends to perform the services, as well as showing that it is committed to this and has the means and capabilities to deliver. Therefore, many tenders may be viewed as hybrids of reverse closed auctions and beauty contests.

Bids that lead to low profitability or even losses create a risk that the supplier will not be able to fulfil the conditions of the contract. Sometimes this becomes obvious already when the shift from the former to the new entrepreneur takes place. In the short run, this may cause sudden interruptions in delivery, resulting in considerable consequences, e.g. for services like public transportation. The procuring authority may be forced to purchase the goods or services from another firm, sometimes at considerable additional costs. When this is not an option, end consumers, such as train passengers, will face big transportation problems, which may have negative socio-economic and environmental effects. In a longer perspective, the confidence for the supply of goods and services is deteriorated, and firms that contribute to a healthy competition may leave the industry. Thereby, the future price competition as well as the innovativeness of the industry may be harmed.

4 High and low bids in tenders

Ideally, all firms participating in tenders of public railway services place bids that relate to their best estimates of costs and

revenues. A realistic bid from the most efficient firm would then win the tender and force the others to improve their competitiveness in order to stand a better chance in the next tender. However, we suggest that firms bidding in these tenders on some occasions place very low or very high bids, not necessarily related to actual costs or revenues. It should be remembered that since we are dealing with public procurement tenders, it is the *lowest* bid that will win a tender, all else being equal.

The presence of very low or very high prices offered by certain firms is of course not unseen in other markets. The peculiarity of the market for public tenders of passenger railway transportation is that a firm that charges a very low or a very high price makes a long-term commitment that, at least in theory, is not possible to forego. If the firm wins with a very low bid it is forced by the contract to supply the services regardless if it will make big losses. Naturally, a firm that wins a tender with a very high bid will earn a high profit level, but probably it will never win the contract in the first place.

In sections 4.1 and 4.2 below we will consider a number of possible reasons why firms may place low or high bids in tenders. As a basis for the discussion, we have organized them into three major categories: production-based reasons, strategic reasons and information-based reasons. In section 4.3 we will then have a look at how some strategic behaviour may result in cooperative schemes or games in an industry. One aim of these efforts is to generate a couple of hypotheses to be evaluated when we move on to look at the empirical data.

4.1 Low bids in tenders[5]

Firms that place very low bids in tenders due to strictly *production-based reasons* may be regarded as the desirable case from a socio-economic point of view. The differences between bids are then viewed as originating from real differences between the bidding firms in terms of competence and production methods that result in completely different cost structures or possibilities for additional income. One important factor may be that some firms are able to gain from economies of scale or scope. We will here take a somewhat closer look at such factors.

A first observation is that differences in firms' cost calculations will be bigger if some inputs are available only in discrete lumpy

[5] This text partly draws from Alexandersson and Hultén (2006).

units. Lumpiness will make the firms' estimate sensitive to how much of the inputs the firm will need to produce the service. The more factors that are lumpy, the more difficult will it be to arrive at a specific plant size that is more efficient than plants that are smaller or bigger. The bigger the service output the less difficult will it be for a firm to achieve an optimal production system. Whenever an input of production switches from being lumpy and discontinuous to becoming variable and continuous the cost curve becomes flatter. Eventually all inputs can be treated as variable costs.

This means that lumpiness is one source of economies of scale. Another is increased productivity of variable inputs. Often a firm can get economies of scale from both lumpy inputs and specialization. Scale economies can also result from learning curve effects, spreading of set-up costs, and certain stochastic processes associated with inventories.

For some tendered services, most or even all bidders may experience falling average production costs due to continuous economies of scale without impact from lumpy inputs. For example, this may be the case when we have a railway line or a railway system with high density and high volume. Here density refers to how intensively a railway system is used, enabling operators to make better use of terminal facilities, rolling-stock and crew (Preston 1996). Another possibility could be a line or a network that has been tendered on many occasions, making the competing bidders well-informed when calculating their bids. If each firm offers a bid based upon its calculated costs plus a profit margin, we may assume that the differences between the bids would be fairly small.

In other tenders, some firms' cost calculation may be affected by lumpy inputs, causing a *threshold effect* in terms of the minimum efficient scale that a firm needs to reach to be competitive in a market place. This would result in discontinuities or steps in the average cost curve. Such discontinuous economies of scale may be present when we have a railway line or system with high density and low volume, low density and high volume, or low density and low volume, resulting in many inputs that are not fully utilized. It may also be the case when a new line or system of lines is being added to an operator's portfolio of other lines, especially if these new lines are separated (for example geographically) from the other lines. While one operator may have spare resources (like under-utilized rolling stock) that are possible to use more efficiently, another may need to acquire a new fleet of vehicles. Another type of threshold could be the costs and efforts related to taking part in a tender and preparing a

bid. Hortacsu and Puller (2005) have argued that such participation costs are not trivial, with consequences for the behaviour of smaller firms.

It can be assumed that the presence of discontinuous economies of scale and threshold effects would lead to a widening bidding space, and thereby the appearance of extreme bids in tenders. This is because some bidders, when calculating their bids based upon costs and different estimates on how much of economies of scale that can be achieved, fall short or beyond a threshold value. This would hold even if demanded quantity is equal for all firms (which is the case for a tendered gross cost contract where the procured quantity of traffic is specified and fixed). If the operator is also free to vary the output in order to maximize income from ticket fares (as in the case of a net cost contract), the operators' different assumptions on demand will become yet another source of bid variation.

There are several *strategic reasons* for low bids in tenders. Used strategically, low bids may aim at ousting out or at least weaken competitors. A firm may practice dumped prices with a consciously calculated loss, or is able to use profits gained in other branches of its business through cross-subsidization. This bidding behaviour is analogous to a strategy of *predatory pricing*. One major problem is the difficulty to separate predatory pricing from the sometimes fierce but legitimate price competition between firms (see e.g. Niels and Ten Kate 2000). While some industrial economists have based their analyses on historical evidence, advocates of the Chicago School have claimed that predatory pricing should be rare – if existing at all. Their main argument is that such a strategy is seldom or never rational from an economic point of view, since it is costly (compared to e.g. acquiring competitors) and often difficult to recoup by future monopoly profits due to entry of new competitors (Ten Kate and Niels 2002). However, during the past 20 years, the views on predatory pricing have changed. The development within the fields of decision theory and game theory has shown that the strategy may be rational in the presence of asymmetric information between different actors, for instance between incumbents and entrants or between management and investors. Small firms with very competitive and innovative products appear to be particularly susceptible to successful attacks of predatory pricing, since their lenders typically have stronger incentives to pull the plug than to run with the risk (Grout 2000). Moreover, aggressive pricing and other practices may function as strong signals to new firms, deterring entry to certain markets (Roberts 1986). Whether predatory pricing is a rational

strategy or not will depend on the objectives of the firm using this type of strategy. Something that appears to be irrational from a profit-maximizing perspective may be rational when other objectives are taken into account (Ten Kate and Niels 2002). Various aspects of strategic bidding in auctions are also discussed by Wolfram (1998), Hortacsu and Puller (2005), Pepall and Richards (2001) and Chen (2000).

Sometimes, a subsidiary to the procuring organization may place a strategically low bid that, if it turns out to be impossible to fulfil, presupposes more money from the owner. A common complaint to the Swedish Competition Authority is that companies owned by municipalities or county councils apply pricing below costs in public tenders, signifying a 'hidden tax subsidy' (Swedish Competition Authority 2004). A related accusation is that low bids from public companies are based upon lower expected rates of return compared to competing private firms. Lundberg (2005) has shown that 'in-house' production units in municipalities' tenders of cleaning service contracts are more likely to win than other firms.

Turning to the *information-based reasons*, it also happens that firms make more or less serious mistakes when calculating their bids. Some mistakes may be due to shortcomings of the internal information systems, producing false impressions of costs and revenues. The basic data provided by the procuring authority may sometimes contain incomplete or incorrect information on the tendered business, leading to faulty calculations. Firms may also have unrealistic expectations on the possibility to perform changes in a certain business, or underestimate the development of costs in the industry. This is probably more common among new entrants than incumbent firms. An incumbent is often viewed as being in a favourable position when its contract is getting re-tendered, due to (among other things) its superior information and experience about the service being tendered (see e.g. Williamson 1976). However, faulty calculations and unrealistic expectations among the other bidders may actually lead to very different outcomes. In particular, *common value auctions* – in which the participating bidders value items differently based upon their judgment of uncertain prospects – tend to be won by the bidder with the most optimistic estimate of the item's value – the so-called *winner's curse* (see e.g. Kagel and Levin 1986).

The actual risks associated with placing very low bids in competitive tenders will naturally be less pronounced if there is a possibility to *ex post* renegotiation of contracts, for example if it turns out to be loss-making for the contracted company. Sometimes, the

contract in itself may include some valid reasons for renegotiation, such as changes in taxation. There may even be clauses (as in some publicly procured infrastructure contracts) that protect a contracted firm to be weakened financially to the point of bankruptcy, forming the basis for renegotiations (Guasch 2004), although this is not the case in Swedish passenger railway operating contracts. In addition to this, a procuring authority may also find itself forced to renegotiate terms if the contractor, once the bidding is over, makes use of its informational advantage and the fact that no alternative contractor may be available until after a time-consuming and costly new round of tendering. In practice, renegotiation of publicly procured contracts seems to be rather common. Guasch et al. (2002) and Guasch and Straub (2006) consider common causes for renegotiations in their extensive studies on concession contracts in Latin America. In Great Britain, several railway franchises were renegotiated as a consequence of the economic problems of Railtrack and the need for more investments in infrastructure (Nash and Smith 2006). In Sweden, the legislatory framework (the law on public procurement and related EU directives) provide rather limited scope for renegotiations without a new tender, for instance as interpreted by the central government agency NOU (2001, 2003). As a rule of thumb, renegotiations are not allowed if they seek to change the original contract in such a way that there is no longer a common 'identity' between the former and latter contracts. For example, an *ex post* renegotiation leading to a 60 per cent price increase was clearly not considered allowed and therefore the contract should have been re-tendered instead (NOU 2001). However, if renegotiations are to be tried legally, they need to be challenged by a firm that finds itself discriminated. This rarely ever happens. In practice, some efforts to use *ex post* renegotiation have been done in the Swedish passenger rail market, but not all have succeeded. Keolis was able to renegotiate its contract in the Stockholm region as new lines were added and Connex got the permission to abort some train departures of its railway services to northern Sweden after renegotiations with Rikstrafiken. The entrepreneurial firm BK Tåg unsuccessfully tried to renegotiate a loss-making contract by suggesting that the firm's assumptions about coordinating its trains with the national network were not fulfilled. When this and other complaints by BK Tåg were rejected the firm went into bankruptcy. One lesson from the Swedish railway market is that a firm that needs a fast change in a contract stands a much smaller chance to achieve a successful renegotiation than a firm that can wait. Therefore, small companies, having less capital and being more vulnerable to extended periods of losses, appear to be less likely to succeed if they demand

renegotiations. This implies that the options to renegotiate a low bid in a tender are not equal between all firms, supporting the proposition that large firms may be more prone to use predatory bidding.

4.2 High bids in tenders

The *production-based reason* for high bids in tenders would be that a bidder may have real cost disadvantages compared to its competitors. In general terms, such cost disadvantages may implicate that a firm has no economies of scale and scope in its operations compared to the competitors, or even experience diseconomies of scale, for example due to a big bureaucracy resulting in high overhead costs. Lumpy inputs and threshold effects, as described in the previous section on low bids, are related sources of high bids in tenders.

A bidder placing a high bid may *strategically* want to signal to its competitors that it has no interest in the market and expects the competitors to likewise signal back that they have no interest in other markets. It may also place a high bid in one period with the intention to present a much more competitive bid in a later period. The initial bid may then only serve the purpose of informing the bidder more about the competitors and the appropriate bid level (see e.g. Latacz-Lohmann and Van der Hamsvoort 1997). It could also be argued that a high bid, although not successful, may change the expectations of the competitors and drive up the price level in later tenders.

Sometimes, the way bids are evaluated open up the possibility for a clever use of strategically high bids. For example, bidders may sometimes be ranked according to their relative position compared to the lowest and the highest bids. By placing a high bid a bidder may not be able to improve its own ranking, but may influence the ranking order of the other bidders. If the procuring entity evaluates the bidders by means of multiple evaluation criteria treated in the same way (for example several price criteria or both price and quality criteria) – awarding 'points' for each criteria – the end result can be very sensitive to the appearance of extreme bids, regardless of their underlying reasons. The extreme bidder may tilt the result in a direction that favours another bidder compared to a case where the extreme bidder had not been present at all. In some cases, the high bidder may even win the tender. (See for example Konkurrensverket 2004 for a related discussion and simulations.)

The *information-based reasons* behind high bids in tenders partly relate to the corresponding explanation for very low bids:

the presence of faulty calculations or a lack of relevant knowledge of costs and revenues related to a certain business. Rational firms that are aware of the winner's curse may also consciously place more conservative bids as the number of competitors increase (Hong and Shum 2002, Hendricks et al. 2003). According to Hong and Shum (2002) an increase in the number of bidders in a common value auction has two counteracting effects on equilibrium bidding behaviour. Increased competition leads to more aggressive bidding – the competitive effect, but at the same time the winner's curse becomes more severe, and rational bidders will bid less aggressive in response – the winner's curse effect. In the case of competitive tenders in the deregulated Swedish railway market the operators generally do not know how many firms that will place bids. However, more experienced firms – for example big firms – may bid less aggressively to avoid the winners' curse for contracts they do not regard as strategic.

A special case of information-based explanation behind high bids may occur if one firm (typically the incumbent) is absolutely confident that no other firm will take part in the tender. Under such conditions, placing a high bid will be a very attractive option.

4.3 Pricing strategies and games

Oligopolistic pricing share all the characteristics of a contest or a game. True, in the deregulated public passenger railway market the oligopolists face competition from different types of firms. In the Swedish market, foreign big international players like Connex, Keolis and the former monopolist SJ could be regarded as oligopolists. These firms meet competition from Swedish start-up firms that begin in one region and then gradually move to other markets. The two most successful start-up firms have been BK Tåg (although finally going bankrupt in 2005) and Tågkompaniet. To further complicate matters, the start-ups have sometimes joined forces with foreign big players in the bids for contracts. BK Tåg did cooperate with Keolis and Tågkompaniet with DSB, the former monopolist of Danish railway operations. All in all, the oligopolists do not control the market.

The firms that participate in the tenders know that this market is a repeated game in two ways. First, new tenders will appear for new railway systems, and second, the market that has just been tendered will be put up for tender again when the winning bidder's contract has expired. An optimum strategy in repeated games is tit-for-tat

(Axelrod 1984, Dixit and Nalebuff 1991). Since public tenders are winner-takes-all markets, the option to increase profits by being soft in all tenders is an untenable proposition for the individual oligopolist. The oligopolists have to come up with something smarter, for example a division of the markets. A firm cannot inform the competitors beforehand about its bid but 'each firm recognizes that its own current and past actions will be treated by rivals as signals of its costs and intentions' (Scherer and Ross 1990: 215).

To make the tit-for-tat rule work in repeated public tenders the oligopolistic firms need to arrive at playing a delayed tit-for-tat game. Firm 1 is soft in tender 1 and firm 2 is tough. In tender 2 firm 1 responds by being tough and firm 2 responds by being soft, and so on. Of course this system of sharing the markets may collapse for different reasons. First, if all the oligopolistic firms play soft to increase profits in repeated tenders, they will attract new entrants to the market. Second, if one firm plays tough in a market where it was supposed to play soft it will force the other to retaliate. Third, haphazardly other firms may win tendered contracts and force the oligopolist that lost to change its strategy. Fourth, small firms may also bid aggressively to win or retake lost market shares. However, their capacity to do so is limited by their relative lack of financial resources.

A functioning tit-for-tat game may be viewed as a sophisticated form of collusive behaviour. Collusion may also be more organized, taking the form of proper *bid rigging* among a group of firms (Porter and Zona 1993, Jakobsson 2005, Phillips et al. 2003, Abrantes-Metz et al. 2006, Bajari and Ye 2003). In such a scheme, the colluding parties cooperate to decide on a winning bid and which firm that will place it, while the others are supposed to place phantom bids or no bids at all.

Any firm can make faulty calculations, but we suggest that (if we exclude downright bid rigging schemes) only large firms can really benefit from strategic pricing that either is below or above costs. Small firms will normally refrain from strategic pricing below costs because of a lack of financial resources and strategic pricing above costs because of the effort and costs of preparing and submitting a bid. Big firms face less severe budgetary restrictions and can therefore submit strategic low or high bids that deviate from their estimated costs. This leads us to the following conjecture: a small entrepreneurial firm will only offer very high or very low bids due to faulty calculations of costs and revenues. An oligopolistic firm may offer very high or very low bids due to faulty calculations, strategic pricing to predate

competitors or to signal that it is soft, or possibly because of a mixture of faulty calculations and strategic pricing. *Ceteris paribus*, this means that small entrepreneurial firms will offer less extreme bids than oligopolistic firms.

5 Data analysis

5.1 Generated hypotheses and issues to be explored

In the previous sections we have come across a number of suggestions and hypotheses on the nature of tendered services and the related bidding behaviour. Before we turn to our empirical analysis, it is useful to summarize what we want to explore and what we expect to find.

First, we want to explore to what extent very low or high bids have really been present in Swedish tenders of railway services.

Second, we seek to categorize the tenders in accordance with our suggested framework of explanations regarding bidding behaviour.

Third, we want to make a more detailed study of the possible impact of a couple of factors upon bid variation:

a) It is reasonable to assume that the size of the traffic tendered may influence bidding behaviour. Large contracts are only possible to handle by a limited number of firms and the related risks should make firms more scrupulous about their calculations and less willing to place bids below costs. Although large contracts may also be considered more interesting from a strategic point of view (which may attract strategic bidders), we nevertheless make the conjecture that bids upon large contracts will show less variation than bids placed in small tenders.
b) The number of bidders should also affect the bidding space, but may do so in several counteracting ways. Generally speaking, more bidders should mean increased possibilities for real differences between bidders. As the number of bidders increase, the increased competition could lead to aggressive bidding (the competition effect), but this may be offset if rational bidders seek to avoid the winner's curse and therefore bid less aggressively (the winner's curse effect). The largest bid variation would appear if there are several bidders and some bid aggressively at the same time as others actively try to avoid the winner's curse.

c) As more and more railway services are subjected to tendering and re-tendering, knowledge on production costs and revenues should become more widespread, and submarkets for various factors of production should evolve. Thereby, all bidders come to face more similar conditions (including continuous economies to scale) which should lead to less bid variation. In other words, we hypothesize that the spread of bids should diminish over time.
d) Since net contracts imply that bidders may vary the output and ticket price and must include their assumptions on demand, bids for such contracts should show more variation than the simpler gross cost contracts.

Fourth, we want to check if incumbents are more likely to win tenders, for example due to better information on costs and revenues.

Fifth, we have expressed the hypothesis that large oligopolistic firms with deep pockets are more likely than small and medium-sized firms to submit very low bids, since they are not as vulnerable to losses as the smaller firms.

Sixth, we want to check if subsidiaries to the procuring authorities tend to place low bids in tenders, as suggested by the 'tax subsidy' hypothesis.

5.2 A note on data availability and limitations

The original intention of the empirical part of this study was to use data on bidders and bids from public tenders of railway services in three countries: Sweden, Germany and Great Britain. However, following some unexpected difficulties in getting hold of usable data, we have been forced to limit this particular study to data from Sweden. For almost the entire 1990s, data on bidders and bids in the Swedish state's tenders was non-official material. Likewise, many local and regional authorities published only limited information when presenting the results of a particular tender. Typically, only the best bid (and sometimes the second best) was presented. In Great Britain, the Strategic Rail Authority will only publicize the winner's bid in terms of subsidies needed or net payments to the state. The situation in Germany seems to be similar. This secrecy is generally motivated by a concern for the bidders, seeking to help them keep their competitive edge and their 'secrets' of how to do business.

Much of the Swedish data that we do have is still not generally available and we have therefore found it necessary to mask our figures in various ways. Unfortunately, missing observations due to the secrecy of some public authorities, limit the possibilities to analyze certain tenders. All in all, about 85 tenders and re-tenders of Swedish railway lines have taken place since tendering of some local services began in 1989.

Many tenders have attracted only one bidder. The majority of these occurred in the Swedish market for tendered inter-regional services. After some unsuccessful efforts to beat the former monopolist SJ in the first tenders the competitors simply gave up, blaming SJ's control of some critical factors of production and of relevant information on revenues. This resulted in that SJ for several years was the only bidder, albeit with the need to defend its bid by means of presenting calculations of costs and revenues to the procuring public agencies. When studying tenders with only one bidder, it naturally becomes impossible to make any direct comparisons with the bids of other firms as a way to seek for high or low bids. However, the rising costs for subsidies during these years, and the sudden drop when new competitors appeared, indicate that SJ did place some high bids in these tenders as long as it was reasonable to believe that other competitors would not give it a try.

The focus of our data analysis is on the 61 tenders where at least two bidders have been active. We have managed to find complete or almost complete data on 37 of these tenders. This sample (chosen only on the basis of data availability) consists of 21 tenders with two bidders, 9 with three bidders, 5 with four, 1 with five and 1 with six bidders, respectively. We have no reason to believe that the sample is inconsistent with the rest of the tenders that we have not been able to include. The available material should at least be sufficient to make some early observations and considerations of our generated hypotheses, to make way for further analysis and testing later on in this type of research.

5.3 Analysis

In order to get an overview of the spread of bids in different tenders, we have plotted the bids in relation to the calculated average of all bids in each tender (defined as an index with value 100). This is presented in Figure 1, in which the tenders are presented in chronological order. Although most bids fall in the range of 10 per cent above or below the average bid, a substantial amount of bids

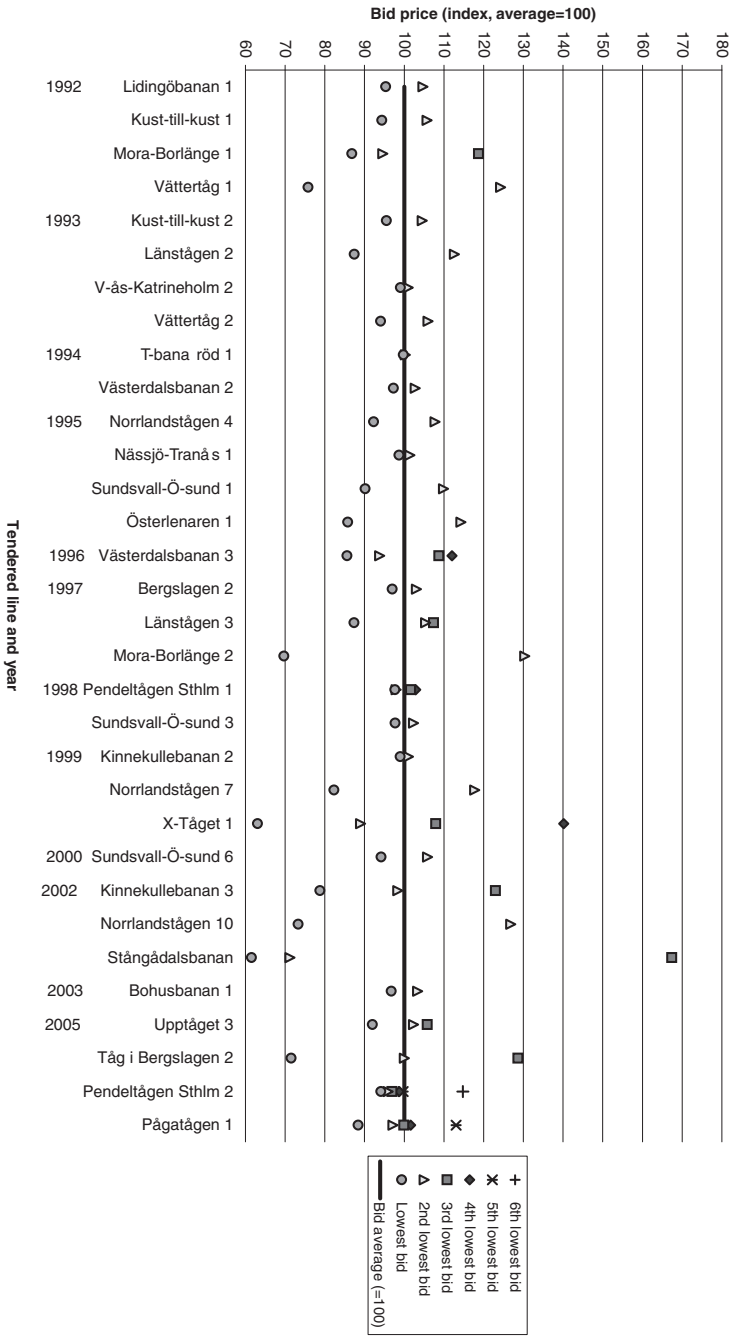

Figure 1 – Swedish tenders of passenger train services 1992–2005: Spread of bids compared to bid average

appear in the range of 15–30 per cent above or below the average. In addition to this there are a couple of data points corresponding to *very* large deviations from the average bid. Bear in mind though that most of the tenders have only attracted two bidders. Therefore, each bid has a profound impact on the calculated average.

Referring to our three basic reasons for differences among bids as described earlier, we have tried to categorize the behaviour of the bidders in all tenders where complete information has been available. Weighting in information on the spread of bids, how many times a certain traffic has been tendered, the bidding firms, and other details regarding each tender, we have compiled a table, showing which bidding behaviour that appears to have been most important for the outcome of each tender (see Table 1). It should be noted that in the very same tender, some firms may (for example) behave in accordance with a production-based approach, while others may behave strategically. Such a tender would then typically be categorized as 'strategic', since this is the behaviour that has had the primary impact upon the outcome.

We have identified 17 tenders where the bidders appear to have a production-based approach and act as if economies of scale are continuous and there is little uncertainty regarding demand and other factors. Most of these cases correspond to re-tendering of lines that over time have become fairly well known by several actors or lines with very limited services. In the data set these are commonly the tenders showing a relatively small variation between the bids. There are also two additional tenders (the fourth and seventh tender of Norrlandstågen) where bids appear to be production-based but show more variation due to important differences (possibly related to discontinuous economies of scales and threshold values) between the competing companies. In six tenders, information-based differences appear to be of importance. Some of these concern lines that are tendered for the very first time and where the bidders have had different access to information on costs and revenues, generating relatively large variations in the bids. In some cases, the lines have been tendered before, but one bidder has clearly miscalculated its bid, for example due to over-optimistic forecasts. In at least seven tenders we have identified behaviour among one or several bidders indicating that strategic bidding is going on. In these tenders, firms have typically placed bids that deviate substantially from the other bids, despite the fact that the costs and revenues related to the contract should be well-known as the services have been tendered before. In our broader set of data (not limited to tenders with at

Table 1 – Tenders categorized according to bidding behaviour

Year	Tendered traffic/line	Bidding behaviour		
		Production-based	Information-based	Strategic
1992	Lidingöbanan; 1st tender	X		
1992	Kust-till-kust; 1st tender	X		
1992	Mora-Borlänge; 1st tender		X	
1992	Vättertåg; 1st tender		X	
1993	Kust-till-kust; 2nd tender	X		
1993	Länstågen; 2nd tender			X
1993	V-ås-Katrineholm; 2nd tender	X		
1993	Vättertåg; 2nd tender	X		
1994	T-bana röd; 1st tender	X		
1994	Västerdalsbanan; 2nd tender	X		
1995	Norrlandstågen; 4th tender	X		
1995	Nässjö-Tranås; 1st tender	X		
1995	Sundsvall-Ö-sund; 1st tender		X	
1995	Österlenaren; 1st tender		X	
1996	Västerdalsbanan; 3rd tender		X	
1997	Bergslagen; 2nd tender	X		
1997	Länstågen; 3rd tender		X	
1997	Mora-Borlänge; 2nd tender			X
1998	Pendeltågen Sthlm; 1st tender	X		
1998	Sundsvall-Ö-sund; 3rd tender	X		
1999	Kinnekullebanan; 2nd tender	X		
1999	Norrlandstågen; 7th tender	X		
1999	X-Tåget; 1st tender			X
2000	Sundsvall-Ö-sund; 6th tender	X		
2002	Kinnekullebanan; 3rd tender			X
2002	Norrlandstågen; 10th tender			X
2002	Stångådalsbanan; 1st tender			X
2003	Bohusbanan; 1st tender	X		
2005	Upptåget; 3rd tender	X		
2005	Tåg i Bergslagen; 2nd tender			X
2005	Pendeltågen Sthlm; 2nd tender	X		
2005	Pågatågen; 1st tender	X		

least two bidders), we have also seen several tenders where a sole bidder has placed what appears to be a high bid. This relates to a situation when the former monopolist SJ still controlled some factors of production as well as relevant information on revenues, making it confident that no other firm would place a bid.

What does the data have to say about trends and factors with possible impact upon bid variation? We have taken a look at the

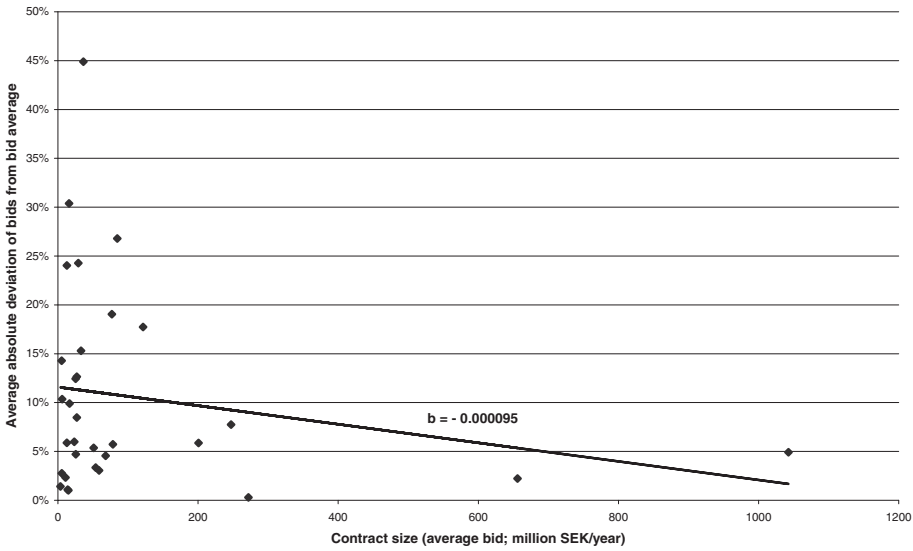

Figure 2 – Deviation of bids – impact from size of tendered contract

size of the tenders, the number of bidders, the number of times tendered, and the general development over time. Bid variation in this analysis has been defined as the *average absolute deviation of bids from bid average*, expressed in per cent. Starting with the impact from the size of the tenders, we have plotted the deviation of bids against the contract size, here defined as the average bid for subsidies (in million SEK per year). This is presented in Figure 2, also including the corresponding linear regression trend line. This line has a downward slope, as predicted by the hypothesis that large tenders should attract bidders with similar thoroughly calculated bids. However, the coefficient's value is close to zero and the null hypothesis cannot be rejected even at the 10 per cent level. As shown in the figure, the number of observations above 200 million SEK is limited and in the lower regions it seems as if bid variation may amount to practically any value.

In Figure 3 we have plotted the deviation of bids from the bid average against the number of bidders in each tender. In this figure we note a reduced deviation of bids when we have more than three bidders, but since this is a rare situation (providing only a few observations) there is limited scope to draw any actual conclusions.

The impact of time and the related maturing of the market may be considered in several different ways. In Figure 4 we have

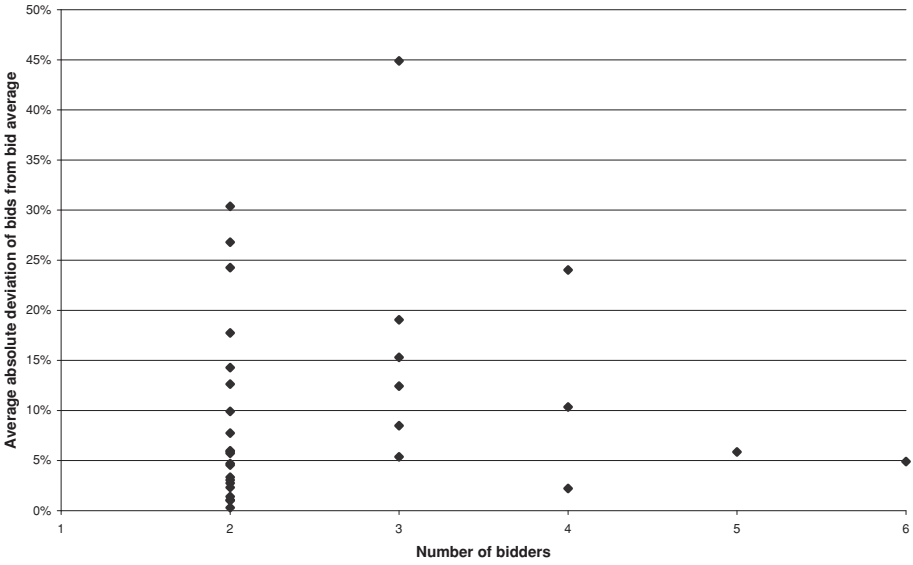

Figure 3 – Deviation of bids – impact from number of bidders

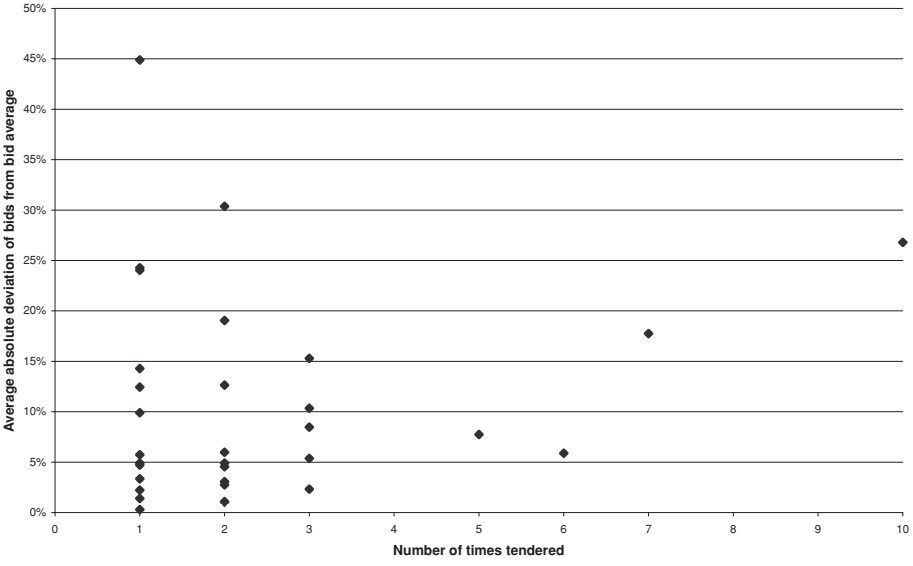

Figure 4 – Deviation of bids – impact from number of times tendered

looked at the impact from how many times a particular traffic contract has been tendered. It appears as if first-time tenders may result in very different bid levels, with less deviation in second- and third-time tenders (it should be noted that this figure does not say anything about how bid deviation has evolved for each specific contract). Data on contracts that have been tendered more than three times is very scarce. Another way to look at the impact of a maturing market is to plot all the values on bid deviation in chronological order (see Figure 5). Looking at all the tenders simultaneously, no clear trend is visible. However, if we separate the gross cost contracts from the net cost contracts, it appears as if bid deviation has become stabilized at a lower level for the gross cost contracts, while bid deviation in tenders for net cost contracts has actually increased in recent years.

In a further attempt to explain bid deviation, we have also done a multiple regression including the following as independent variables: tendered contract size (measured as the average bid in million SEK/year), the number of times tendered, and finally the number of years passed since tendering started (in 1989). No significant coefficients (at the 90 per cent level) came out of this analysis. The number of bidders was excluded as a variable in this regression since we discovered a positive correlation between the size of the contract tendered and the number of bidders.

What can we say about who tends to win the tenders? According to our empirical data, the incumbent may not be in such a favourable position as often suggested. Out of 61 tenders with more than one bidder, the incumbent was able to win 33 tenders while 28 were lost to other companies. In 3 of these tenders, the incumbent did present the lowest bid, but another company offered better terms in other respects and came out as the total winner. Interestingly, we find some notable differences when we compare the results of the tenders of gross cost contracts to those of net cost contracts. Out of 31 tenders with gross cost contracts, the incumbent was able to defend only 12 (39 per cent), while succeeding in 21 (70 per cent) of the 30 tenders with net cost contracts. Consequently, the higher complexity of the net cost operations seems to have mattered. Another explanation is that parity among bidders has improved over time (as more and more factors of production have been divested from the former monopolist SJ), but came later for this part of the market. A general observation is that the position of the incumbent has weakened in recent years. Since 1995, the majority of the tendered gross cost contracts have been won by firms other than the incumbent. A similar (but less apparent)

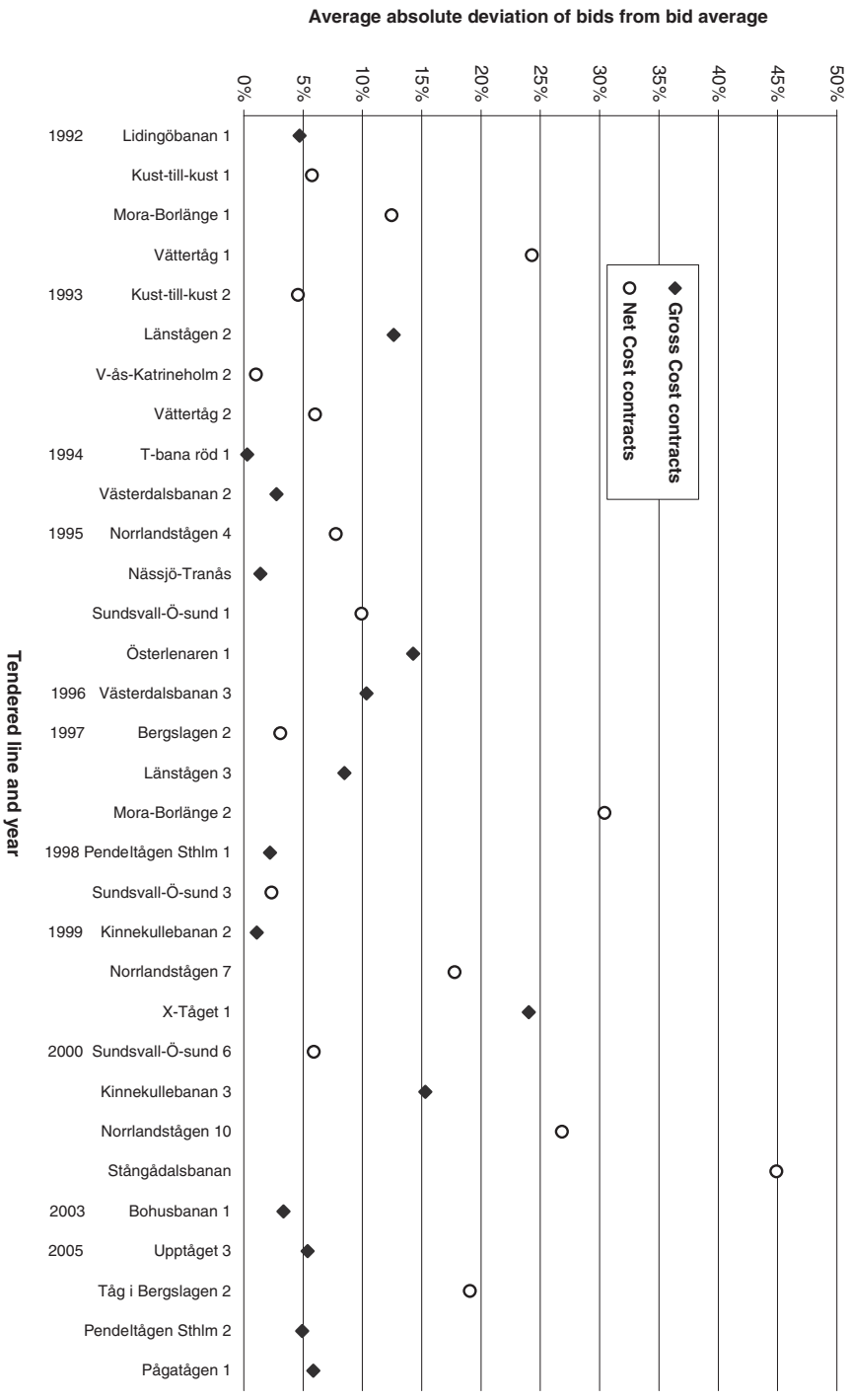

Figure 5 – Deviation of bids – development over time

trend shift appeared in 1999 for the net cost contracts. Again, it should be noted that these findings only refer to the tenders with at least two bidders.

We now turn to the bidding behaviour of the actual firms taking part in the tenders, finding some notable differences and similarities among them. Large firms, like the incumbent former monopolist SJ and French-originated Connex, have commonly placed either the highest or the lowest bid in all tenders, and roughly both 'strategies' have been used 40–50 per cent of the time (see Table 2). Perhaps surprisingly, up-start firms like BK Tåg and BSM have placed the highest bid in about 50 per cent of the tenders they have participated in. This may be explained by the fact that either BK Tåg or BSM have often been the only contender to SJ on occasions when SJ has placed the lowest bid, sometimes lowered at the very last minute in order to avoid new entry. Tågkompaniet, entering the industry rather late but now the largest of the upstart firms, has placed the lowest bids in most of its tenders. In the cases where subsidiaries to the procuring CPTAs have participated, they have almost always (86 per cent) placed the lowest bid. They have never placed the highest bid. This provides some support to the hypothesis that such firms may benefit from a hidden tax subsidy.

In Table 3 we have tried to identify other patterns in the behaviour of the bidders, looking at the percentage deviation (in absolute terms) of each bidder's bid from the tender average and median. Again, we have to bear in mind that a certain bidder's deviation is affected by the bids of other bidders, especially in tenders where only two bidders have been active. The bids of Connex (but also Tågkompaniet) stand out. On average, Connex has placed bids that have deviated from the average by 17 per cent and from the median by 21 per cent. For the other firms (that have participated in at least four tenders), figures in the magnitude of 10 per cent seem to be more 'normal'.

There are a limited number of tenders (10 in total) where more than two participating bidders are known in terms of both firm name and bid price. These have been scrutinized in a special way. In order to measure the impact of each bidder, we have calculated the bid average with and without each bidder's bid and checked how much the value is affected when a specific bid is included. The results are presented in Table 4. From this limited number of tenders it is difficult to draw any definitive conclusions, but the calculations support the earlier observation that SJ and Connex tend to tilt the average in a certain direction (either high or low).

Table 2 – Companies participating in tenders – share of lowest and highest bid

	SJ	Connex	Via GTI/ Keolis	Stage-coach	Other large firms	CPTA subsidiary	Tåg-kompaniet	BK Tåg	BSM	Other small firms
Number of bids	32	14	3	3	2	7	7	16	6	4
Lowest bidder; share in %	43.8%	35.7%	0.0%	0.0%	0.0%	85.7%	57.1%	31.3%	16.7%	25.0%
Highest bidder; share in %	43.3%	46.2%	66.7%	0.0%	50.0%	0.0%	14.3%	50.0%	50.0%	0.0%

Table 3 – Deviation from bid average and median

	SJ	Connex	Via GTI/ Keolis Keolis	Stage-coach	Arriva	Other large firms	CPTA sub-sidiary	Tåg-kompaniet	BK Tåg	BSM	Other small firms
Deviation from bid average (percentage units)	9.4%	17.0%	15.3%	1.5%	2.8%	13.1%	2.0%	17.0%	10.5%	11.0%	12.0%
Number of observations	28	11	2	1	1	1	3	6	15	7	2
Deviation from bid median (percentage units)	8.1%	21.0%	15.2%	1.8%	2.7%	13.3%	5.1%	16.7%	8.8%	10.1%	7.2%
Number of observations	28	12	2	1	1	1	5	7	15	6	3

Table 4 – Change of bid average when including a specific bidder (tenders with >2 bids)

Year	Traffic/ Line	Change of bid average when including a specific bidder									
		SJ	Connex	Via GTI/ Keolis	Stage-coach	Arriva	DSB	Tåg-kompaniet	BK Tåg	BSM	Other small
1992	Mora-Borlänge	−6.22%							10.29%	−2.62%	
1996	Västerdalsbanan 3rd tender	4.17%							−4.61%	2.98%	−2.03%
1997	Länstågen 3rd tender	3.80%							2.77%	−5.98%	
1998	Stockholm commuter trains	0.98%	−0.79%	−0.68%	0.51%						
1999	X-Tåget	2.70%	15.46%					−10.99%	−3.54%		
2002	Stångådalsbanan	−12.59%	50.75%						−16.15%		
2002	Kinnekullebanan 3rd tender	12.96%	−9.63%						−0.81%		
2005	Upptåget 3rd tender	−3.87%	2.95%					1.18%			
2005	Tåg i Bergslagen 2nd tender		0.00%	16.67%				−12.50%			
2005	Pågatågen	−0.04%	−2.83%			−0.70%	3.38%	0.40%			

6 Discussion and conclusions

Public tendering has become an important tool for procuring authorities to increase competition between suppliers of products and services. Ideally, the most efficient firm would win a tender with a bid based upon realistic assumptions on costs and revenues. However, for a number of reasons, this may not always be the case. The peculiar characteristics of public tendering may a) influence the possibilities for the firms to calculate realistic bids, and b) make strategic pricing an attractive option because in these markets it may be more advantageous to become an incumbent compared to other competitive markets.

We started with the assumption that firms bidding in these tenders on some occasions may place very low or high bids, not necessarily related to actual costs or revenues. We have constructed three basic reasons behind bids that are either very high or low. The first, production-based, reason is that the firm bases its calculation on different assumptions than its competitors, concerning the costs of inputs, the lumpiness of inputs, economies of scale of variable inputs, and market revenues. The second reason is strategic bidding, for example that a firm offers an aggressive low bid to win a market or wants to signal with a high bid that it is soft in a market. The third, information-based, reason is that firms have incomplete information on the behaviour of the competitors and on their true costs when placing bids.

Our first conclusion is that the available data from Swedish tenders of railway services show that there certainly exist examples of very low and very high bids, but also tenders where the bidders have placed rather similar bids.

We have identified 19 tenders where the bidders appear to have a production-based approach. In most of these, the bidders act as if economies of scale are continuous and there is little uncertainty regarding demand and other factors, resulting in a relatively small variation between the bids. In two tenders, threshold values and discontinuous economies of scale appear to be of importance, resulting in relatively large variations in the bids. In six tenders, information-based differences seem to have played a role, leading to miscalculations and substantial differences between bids.

While some extreme bids are explained by firms' different assumptions on costs and revenues (some realistic – some not), others may be related to strategic pricing or even multi-period strategic

games. In at least seven tenders we have identified behaviour indicating that strategic bidding is going on.

We have tried to estimate the impact of a couple of factors upon bid variation, such as the size of the tendered contract, the number of bidders, various aspects related to the maturity of the market, and the type of contract (gross cost or net cost). In all these analyses, we have defined bid variation as the absolute average deviation of bids from the average bid level. We have found a slight but not significant negative impact from tender size upon bid deviation (as hypothesized). One might say that small contracts may result in any bid deviation (high or low), while larger contracts show less deviation. Most of the other variables checked do not lead to any clear conclusions, but it appears as if bid deviation has risen in tenders of net cost contracts in recent years, a trend not seen in the tenders of gross cost contracts. This increase in bid deviation in tenders of net cost contracts is accompanied by more entrants winning contracts from the incumbents.

Contrary to what is often presumed, it appears difficult for the incumbents to keep their contracts when they are re-tendered (see Lundberg 2005, for similar results and a discussion on the limited impact from historical relations in repeated tenders). This is particularly apparent for the gross cost contracts, but there is also a time factor, implying that in a more mature market incumbents have fewer advantages. The weakened position of the incumbent may thus be explained by improved parity among bidders, but also by strategically low bids from companies wishing to enter the market.

We have argued that primarily large oligopolistic firms will be able to practice strategic bidding, since they are less restricted financially. For the same reason, they are also better suited to endure a loss-making period and succeed to reach a renegotiation without a new tender, thereby reducing the actual risk of placing low bids in tenders. Our empirical analysis supports the conjecture that large firms like SJ and Connex have been more likely than other firms to place either very low or very high bids in tenders. Moreover, Connex's bids tend to deviate more than the other bidders from the average bid level. The high share of low bids from the CPTA-managed firms also supports the hypothesis that they may have counted on additional taxpayer money from their owners if necessary.

Unfortunately, the relative lack of empirical data has made it difficult to perform rigorous tests of our hypotheses/propositions regarding the presence of high and low bids in tenders. As has been

mentioned previously, we have encountered significant problems when approaching the procuring entities to obtain data on bidders and bids in tenders of railway services (we have not queried the bidders about their bids in the different tenders). We find it notable that this kind of data on competitive tenders is so difficult to get access to. The official policy of the European Union as regards competition and liberalization may be expressed by the following citation: 'If a company is awarded the monopoly over a public service that any one of a number of companies could provide, the selection process must be transparent' (Europa 2004). In our opinion, the common practice of secrecy applied by the procuring authorities in several countries belies this policy of transparency. It pulls public procurement of railway services even further away from being normal markets, ultimately increasing the firms' perceived gains from strategic bidding. It is sometimes argued that transparency may also facilitate collusion, since it will expose firms that, for example, feel tempted to break with a bidding ring (see e.g. Phillips et al. 2003). Nevertheless, we believe that the negative aspects of limited transparency will dominate in recently liberalized markets, due to the impact upon potential new entrants. (See Boehm and Olaya 2006, for a discussion on the benefits and trade-offs of transparency in bidding procedures.)

The actual presence of strategic bidding has also probably disturbed the possibilities to analyse the data and test other hypotheses on bidding behaviour and development over time. Some of the relationships we have studied may have proven stronger if strategic bids had been excluded. This adds to the more general argument that strategic bids disturbs the functioning of the market by making it more unpredictable, which ultimately may deter more rational companies from entering and keeping competition healthy and sustainable.

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Enchères élevées et faibles lors d'adjudications. Stratégie de prix et autres comportements lors de soumissions à des appels publics de services de transport ferroviaire de personnes

Une composante importante de la dérégulation du secteur public dans l'Union européenne concerne la mise en adjudications publiques de services et produits. Cet article examine les comportements des entreprises qui participent à des appels d'offres publics dans le secteur du transport ferroviaire de personnes en Suède. Dans la partie théorique de l'article, les auteurs discutent les diverses explications possibles d'enchères élevées et basses, en liaison avec une discussion sur les stratégies de prix et sur les économies d'échelle continues ou discontinues en matière de coûts de production. Des données détaillées sont ensuite analysées sur les offres et les soumissionnaires de services ferroviaires en Suède ; 37 appels d'offres qui se sont déroulés entre 1989 et 2005 sont inclus dans l'analyse.

Hohe und niedrige Gebote bei Ausschreibungen: Strategische Gebote und anderes Bieterverhalten bei öffentlichen Ausschreibungen von Eisenbahn-Perso-nenverkehrsdienstleistungen

Eine wichtige Komponente bei der Deregulierung des öffentlichen Sektors in der Europäischen Union ist die öffentliche Ausschreibung von Dienstleistungen und Produkten. In diesem Beitrag wird das Bieterverhalten von Unternehmen untersucht, die sich an öffentlichen Ausschreibungen von Eisenbahn-Personenverkehrsdienstleistungen in Schweden beteiligen. In einem theoretischen Teil warden verschiedene mögliche Gründe für hohe und niedrige Gebote bei Ausschreibungen diskutiert – in Verbindung mit einer Erörterung von Gebotsstrategien sowie kontinuierlichen und diskontinuierlichen Skaleneffekten hinsichtlich der Produktionskosten. Es werden dann detaillierte Daten über Gebote und Bieter bei Ausschreibungen von Eisenbahndienstleistungen in Schweden analysiert. 37 Ausschreibungen, die zwischen 1989 und 2005 stattgefunden haben, werden in die Untersuchung einbezogen.

Licitaciones al alza y debilidades en las adjudicaciones. Estrategia de precios y otros comportamientos de las ofertas en las subastas públicas de los servicios de transporte ferroviario de personas

Un componente importante de la desregulación del sector público en la Unión Europea es el relativo a las adjudicaciones públicas de bienes y servicios. Este artículo examina los comportamientos de las empresas que participan en las licitaciones públicas en el sector del transporte ferroviario de personas en Suecia. En la parte teórica del artículo, los autores discuten las diversas explicaciones posibles de las licitaciones al alza y a la baja, en relación con una discusión sobre las estrategias de precios y sobre las economías de escala continuas o discontinuas en materia de costes de producción. A continuación se analizan los datos relativos a las ofertas y a las adjudicaciones de los servicios ferroviarios en Suecia: 37 licitaciones desarrolladas entre los años 1989 y 2005.

Essay 7

Prospects and Pitfalls of Public-Private Partnerships in Railway Transportation. Theoretical Issues and Empirical Experience

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PROSPECTS AND PITFALLS OF PUBLIC-PRIVATE PARTNERSHIPS IN RAILWAY TRANSPORTATION. THEORETICAL ISSUES AND EMPIRICAL EXPERIENCE*

GUNNAR ALEXANDERSSON · STAFFAN HULTÉN**

PUBLIC-PRIVATE PARTNERSHIPS (PPPs) have attracted much attention in recent years as possible means to handle large and costly projects, such as the construction of new infrastructure. From a European perspective, the transportation sector has been particularly affected in this respect. This can be explained by several factors. We consider the progressively deregulated transportation markets, allowing for an increased role of private sector ownership and involvement, coupled with the budget-restrictions of several EU member states, to be the most important ones.

The overall goal of PPP projects is to find solutions to problems in which the advantages of the private sector (such as financial assets, efficient management, propensity to innovative and entrepreneurship) are combined with the advantages of the public sector (such as social and environmental concern). To be economically sensible, a PPP project should generate a combination of allocative efficiency and productive efficiency that is superior to an entirely public or entirely private project (Välilä, 2005, p. 100).

This article takes a closer look at the prospects and pitfalls of using PPPs in the transportation sector. We will start by considering the various forms of PPPs as they are described in the literature and discuss the generally observed advantages and disadvantages. Our discussion aims at relating the advantages and disadvantages to economic theoretical constructs such as specialised knowledge, hold-ups, hostage-taking and lock-ins. We will then turn to the transportation sector and present some cases that highlight both additional and previously discussed issues. The focus is upon long-term projects involving investments in new infrastructure for roads and railways. In the remain-

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ing sections of the article, we use the empirical findings to enrich the discussion on advantages and disadvantages, focussing on the development of the same theoretical constructs as mentioned above. In our conclusions we will also discuss the possibilities to avoid some of the problems typically encountered in PPP projects.

Typology of PPP projects

PPPs refer to contractual agreements formed between a public agency and private sector entity that allow for greater private sector participation in the provision of a public service – for example a transportation system. There are numerous ways to categorise PPP projects. While some scholars argue that "true" PPPs always involve private infrastructure investment and ownership, Benett, Grohman and Gentry (1999) describe PPPs as a spectrum of cooperative relations between private and public organisations directed towards the supply of infrastructure services. Some PPP projects may be very long-term, including new infrastructure investments as in concessions and Build-Operate-Transfer projects, while others may be more short-term, concerning reinvestments only – and sometimes even limited to the task of operating a finished construction. Estache and Serebrisky (2004) identify four principal types of PPP contracts: 1) divestments of public property or businesses to the private sector, 2) greenfield investments, for example the building of a toll motorway, 3) service contracts that can include promises on investments, and 4) concessions, licenses and franchise agreements, which often have a life span of 10-30 years and include detailed provisions on investments and service levels.

In Figure 1, abbreviated from US Department of Transportation (2007), we find a classification that categorises PPP projects in terms of the varying degree of public and private sectors ownership and commitments related to the projects. In a Design-Tender-Build project a public agency pays for a building project that can be carried out by either public or private firms. A tendering procedure for a service contract may lead to the entry of a private firm that operates a transport system that is publicly subsidised. In a Design-Build project the private firm accepts the responsibility for the design, the construction and the operation of a transport system. In a Build-Operate-Transfer project a tendering procedure decides which company that will build and then operate a transport system. After a long time-period, for example 30-50 years, the transport system is handed over to the public sector. In a Design-Build-Finance-Operate project the private sector accepts all responsibility for the project. This type of transport project was tested in Great Britain in

the early 1990's. Road projects that use shadow tolls or privately owned roads financed with user charges may use this model.

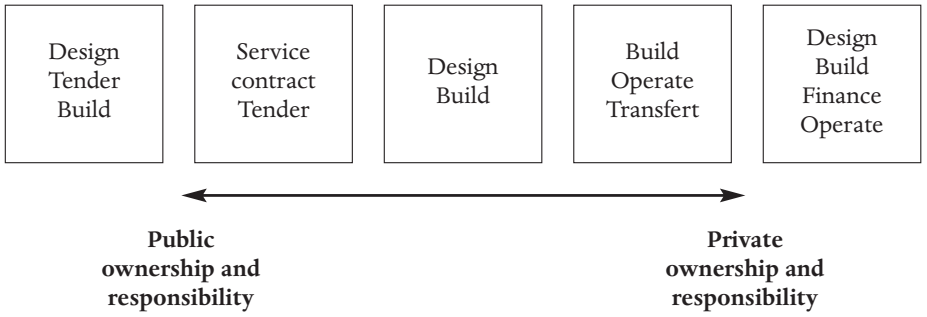

Figure 1. Different types of PPP models depending on the level of public/private ownership and responsibility.

Advantages and disadvantages with PPPs

Advantages with PPPs

A PPP presents numerous advantages both for the public partner and the private partner (Government of Quebec, 2004). The private partner is likely to get access to new sectors and achieve more business activity, enjoy better margins and get more long-term revenues. Since the alternative to a PPP solution is typically a public-only investment related to public services, the implications for the public partner have been getting much more attention in the literature. This is also true for the article at hand, but the implications for the private sector are also considered, although in a more indirect way.

The advantages for the public partner may be summarised into the following broad arguments, which we will consider in more detail below: 1) improved service quality, 2) lower project costs, 3) risk sharing, 4) earlier and faster construction, and 5) better budget fulfilment.

Improved service quality

By the use of contracts, the public partner is able to specify and regulate the level of service quality to be offered to the public. The private sector may also carry special expertise and technology that will result in improved service quality. The use of competition in operations may create even more incentives for improved quality by means of entrepreneurial development and innovation.

Lower project costs

PPP projects typically encompass a wide range of activities – design, construction, and future service provision. If all these activities are held together – bundled – in one project rather than being separated into its different parts, better overall solutions are possible to accomplish. The life cycle costs of the whole project can therefore be minimised (see for example Boef, 2003). The role of bundling has also been investigated by Hart (2003). A similar effect may also be reached due to the specialised knowledge held by some firms regarding this type of projects, in contrast to the public agency that may only encounter these projects once in a while. When public agencies face additional difficulties to acquire such knowledge by themselves, the role of the private sector to bring expertise into a project becomes even more important (De Bettignies & Ross, 2004). It is important to note that the lower costs for the public sector may not only arise from the private partner's ability to achieve cost savings, but also because of its similarly enhanced possibilities to create additional revenue.

Earlier and faster construction

If the public sector is unable to finance all the projects that are considered to be beneficial from a socio-economic point of view then the private sector can participate in the financing of some projects organised as PPP projects. Thereby, public resources for investments may be better allocated over time, and the positive effects of an infrastructure investment may arrive earlier than if only public financing is available (Statskontoret, 1998). On a related note, PPPs can make it possible for governments to build major projects without the cost counting against the Public Sector Borrowing Requirement. Although essentially an accounting convention, this has been a major underlying factor for example in the UK.

In a PPP project where activities such as design and construction are combined, they may be carried out in parallel rather than sequentially. This typically shortens the project's completion time. According to a British study, only 24% of all new PPP projects are running late, compared to 70% of the earlier public-only projects (National Audit Office, 2003). Contract design and other incentives (for example the possibility to gather revenues from infrastructure usage) may also have a positive effect on the time of completion.

Although PPP projects generally have a longer planning phase, it is often possible to compensate for this in the construction phase.

Better budget fulfilment

When the private sector is responsible for the design, construction and future service production, it can create a high degree of assurance to the public sector that the project goals are reached and kept in line with the price and subsidies agreed upon at the time of signing the contract. This reduces the possibility for large unexpected cost increases, which facilitates the long-term planning of the public sector. Investigations have shown that PPP projects keep their budgets far more often than public-only projects (22% over budget compared to 73% over budget) (Poulter, 2004).

Risk sharing

PPP projects should be designed so that each specific risk associated with the project is borne by the partner best suited to handle this risk. This is considered as one of the most important advantages of a PPP project solution. Since PPP projects typically give the private sector a greater responsibility for project design, construction, service obligations and financing, there is a net transfer of risk from the public sector to the private sector. In the literature, there is a general consensus that private firms are better than the public sector to manage construction and market risk and project time – if they are in charge of a project. For example, a private firm exposed to a market risk will act vigorously to safeguard the profitability of the project. However, some risks, like weather, natural disasters and policy changes are better managed by the public sector. Risks that in some cases are highly interdependent on policy changes may be shared by both partners. For example, long-term demand forecasts (one type of market risk) that are sensitive to general transportation policies, could belong to this category (see Table 1).

Table 1. Appropriate division of different types of risks between partners in a PPP project.

Public partner	Private partner	Public or private partner (varies from case to case)
Political decisions Regulation Weather Natural disasters	Market risks Construction risks Project time	Demand forecasts

Disadvantages and problems with PPPs

PPP projects are typically complicated projects. One major reason for this is the fact that the projects generally have to deal with long-term investments that are divided into two phases – the construction phase and the operational/maintenance phase – being very different in character and implying different demands. Empirically, problems and failures have generated more discussions than the advantages of PPPs, while – in contrast – the theoretical literature mentions only a few disadvantages. Clearly, these are important to consider in order to reducing the risks of running into problems that are avoidable. We can broadly identify three types of problems. The first depends on the fact that the state, during normal economic circumstances, can borrow money at a lower cost than private firms, and the second and third types of problems – hold-up and lock-in – arise because of the difficulties in writing complete contracts. The outcome of this can be that the advantages of increased private involvement in infrastructure projects may be constrained by badly designed contracts that may either include way too high or way too low compensation to the private actors in comparison to their efforts and bearing of risk.

Higher costs of capital

In theory, there is no safer borrower than the state and the state should therefore always be able to get the best interest terms available when additional funds are necessary to finance a large-scale project. Private firms may also need extra compensation for bearing some of the financial risks associated with a large project. As long as the state or another public agency is present as a partner and somehow guarantees that a project will be completed, it should however be possible to achieve similar costs of capital also for the private firms that take part in a PPP project. (See for example De Bettignies & Ross, 2004, for a critical review of the differences between governments and the private sector when it comes to costs of borrowing.)

Complicated contracts and hold-ups

Hold-up problems occur when un-anticipated events place the contractual relationship outside the self-enforcing range. This may happen if all the actors in a PPP are ignorant or if one actor deceives the other actors by providing incomplete or distorted information (Klein, 1996, pp. 444-45). The reason why hold-ups aren't negotiated in the contractual stage is because they are surprises in the sense that the particular conditions that will lead to the hold-up

are considered unlikely and therefore costly to negotiate in the contract (Klein, 1996, pp. 461).

If we bring these general notions into the realm of public-private partnerships it can be argued that PPP contracts tend to be complicated due to the difficulty to cover (in detail) all the effects and the risks associated with large and long-term PPP projects. It may therefore take a long time to negotiate all the contract terms which increases the costs and prolongs the project time in the introductory phase. PPP agreements have also been viewed as being particularly prone to contractual incompleteness (Välilä, 2005; Nilsson, 2006). Consequently, PPPs often present risks that result in hold-up becoming an issue. Hold-up as a problem in infrastructure PPPs has to our knowledge not been treated in the literature. Hold-ups in PPP contracts can either be non-opportunistic (due to actors' lack of knowledge about the future) or opportunistic (due to actors consciously disclosing incomplete or distorted information to gain an advantage in a complex transaction). The latter type of hold-ups is more difficult to manage in a contract, because an opportunistic actor seeks to gain a contractual advantage (rent based on superior knowledge) by not making a complete disclosure of his knowledge about a project. This information may only gradually become apparent to the other actors involved in a long-term project as they acquire information about the project's functioning and effects.

Some insights into how the hold-up problem can be managed can be found in Bös and Lülfelsmann (1996). They argue (p. 71) that a welfare-maximising public partner should offer renegotiations and higher compensation to avoid the hold-up problem in the public procurement of specific goods when necessary innovations drive cost increases that were unforeseeable by both actors. Another way of managing the non-fulfilment of a PPP contract would be for the procuring entity to ask for safeguards like surety bonds (Calveras et al, 2004) when negotiating the project. This can provide a guarantee against interrupted delivery or complete withdrawal due to financial distress, e.g. by assuring commitment from company owners. However, its applicability is probably very dependent on the context of the PPP project. Surety bonds seem to work well in the construction industry, where the aim is to make sure that a building or any type of construction is completed (see for example the report prepared by the DGIII Working Group on Abnormally Low Tenders, 1999). In a transportation sector PPP that includes both a construction stage and an operational stage a loss-making firm may regard the surety bond as a sunk cost and exit the contract.

Reduced flexibility with long-term contracts and lock-ins

Many PPP projects presume long-term commitment from all parties, which may create lock-ins and reduced flexibility. Lock-ins may sometimes be exploited strategically, as in the case of hostage-taking. This refers to when one party has made a sunk investment in a second party, an investment that presumes that the relationship continues. The second party may use this sunk cost as a hostage to hold up the first party, ensuring that a sequence of transactions takes place or seeking renegotiations in its favour (Williamson, 1983; Hoff, 1994).

In case a project is profit-making the actor in control of costs and revenues can continue to manage the project as long as it wants. However, if the project is loss-making the actor in control can either demand a renegotiation – or dissociate itself from the project by accepting any sunk costs. This means that the public partner is in a potentially disadvantageous position. Profitable projects will continue without renegotiations while loss-making projects stand the risk of being renegotiated or terminated.

PPP projects in the transportation sector

The history of transportation of the past two centuries shows that regardless if the focus is on railways, bus traffic, roads, airports or seaports, cooperation between the public and the private sectors and how to regulate this has been a recurrent policy problem. The trends to deregulate several transportation markets have put renewed emphasis on the role of private sector investment and ownership in the transportation sector. In a report from the World Bank (Estache & Sirebrisky, 2004) there are references made to the Public Works database, highlighting that 1137 new transport projects between 1985 and 2003 involved private actors, amounting to a collected sum of investments of 684 billion US dollars. This equals an average of 600 million US dollars per project. 50% were directed to roads, 22% to railways, 16 percent to airports and 12% to seaports. The developing countries accounted for 60% of the projects. Among the developed countries, the US accounted for 122 projects, Great Britain for 64 (although a larger share, 27%, of the invested money compared to the US figure, 17%). Other countries with a high level of private capital investments in infrastructure projects were Canada, Spain, Australia and Portugal. The investments in Europe were mainly directed towards toll road projects and railways.

Most observers agree that private actors – for example construction firms, vehicle manufacturers, operators and banks – in the future will become even more active in transport projects through PPP agreements. According to the

World Bank, the private sector will likely continue its involvement and invest hundreds of billion US dollars in the coming 10-year period. In conclusion, the public works projects with private investors amount to huge numbers, with important consequences on fiscal policy (potentially shifting some of the financing of several constructions from all taxpayers to end-users), private sector growth and development of new companies.

In the following sections we will look at some European PPP projects in the transportation sector and their related experiences regarding the prospects and pitfalls of PPP project solutions. We will start by a review of some general experience gathered from a number of cases, followed by a closer look at some specific rail and high speed rail investments: the Channel Tunnel (including also the link from the Channel Tunnel to London), the Öresund bridge, the Arlanda airport link, and the Östgöta railway link.

General experience from European PPP projects

The General Directorate for regional policy at the EU commission has studied a number of PPP projects in Europe from several sectors, including the transportation industry (Commission of European Communities, 2004). The analyses were based upon an evaluation model looking into six criteria/dimensions: the value of the investment, the responsibility of the private partner, the contract length, the demand risk, the accessibility risk and the contract type. Several general lessons were learned, summarised below.

The division of risks between the parties is a key to an efficient PPP solution. Without a proper balance in this respect, costs may rise or one or several parties may face difficulties developing its full potential. In order to have a successful division of risks it is necessary that the public authority achieves a thorough insight regarding the goals one wishes to reach and thereby the character of the project. This includes an understanding of the strengths as well as the weaknesses of each participating actor.

As has been mentioned previously, each specific risk should be borne by the partner that is bets suited to handle that risk. Several cases illustrate that costs will be added if too much risk is transferred to the private sector partner. In addition, they show that each case is unique in some sense and therefore its risk profile should be investigated separately. The larger a project gets in terms of economic value, the greater the temptation to transfer too much risk to the private partner, which then has to be matched with a greater potential for generating profits.

It is necessary to have a long-term political commitment and support, especially when it comes to large projects and when a PPP arrangement is be-

ing tried for the very first time. The risks of project abortion as an effect of protests from the public must not be underestimated. This is particularly important if the PPP project is founded on user fees motivated by promises on improved service levels or quality. Closely connected to this is the importance to show that a project really delivers value-for-money. In some countries, this is the reason behind a special evaluation procedure to the effect of showing when a PPP solution is more cost effective than a traditional procurement procedure and provides additional value. The method may also be used in order to find the most efficient project design and to identify strengths and weaknesses.

There is a need for a well-defined context when it comes to laws and regulations. This makes it possible to sign contracts with some certainty and that the parties are aware of the limitations of their interaction with one another.

Not least in the transportation sector, there are many examples of projects that have failed due to inaccurate prognostication of demand or costs. Since the economic viability of many projects depend on the outcome of a complex interaction between all the parties involved in the provision of the transport service, it is necessary for everyone involved to make accurate estimations of the project parameters.

The transportation projects studied by the Commission (most of which were concessions or BOT projects) also highlighted some specific lessons, as follows.

As illustrated by the Wijker tunnel case in the Netherlands, the participating actors may sometimes have very different goals and working methods. In order to make a PPP project successful under such conditions, it is vital that these differences are identified, understood and integrated into the project. This case, together with a number of Hungarian road projects, also shows the importance of prognoses and the difficulties of getting these to match the actual outcome. They also show the need for flexibility in contract compensation levels (paid by the public sector), based upon the possibility to revise revenue flows in accordance with actual demand, especially if the latter fails to develop as expected due to other public sector actions. It is important that the PPP project does not develop as an isolated system but as a part of a larger context. In the Hungarian case, the economy of the PPP project became deteriorated by another parallel road.

Political and public demands may have negative impacts upon the continued expansion of PPP projects or increased involvement from private sector actors. This is illustrated by the project for Hamburg's international airport, in which political concerns limited the share of private ownership.

The Channel Tunnel

During the 1960s and 1970s, the French and British governments had tried but ultimately failed to reach an agreement on public financing and management of a tunnel under the English Channel connecting the two countries (Bonavia, 1987, pp. 86, 129-130). According to the plans, the tunnel was to be built by private firms in cooperation and the tunnel to be complemented by new railway links from the capitals to the tunnel in both countries. Mr Bonavia, who was director of the Channel Tunnel project, claims that the real reason for the newly elected British Labour Government's abandonment of the Channel tunnel project in 1975 is to be found in the British political system. At the crucial time when the Channel Tunnel bill was to be passed through Parliament, two elections took place in 1974 that slowed down and eventually put a halt to the legislative process. The road to abandoning the project started with a demand from the Secretary of State that British Rail should find a new and less expensive rail link between Cheriton and London. This meant that the timetable for the final decisions on the project could not be followed. This triggered the private firms selected to build the tunnel to give a formal notice to the British government, demanding compensation because its non-ratification of the treaty meant that from a legal point of view the project had been abandoned. At the same time, the companies suggested a new timetable and renegotiations. The response from the British government was to accept the notice of abandonment and to pay the shareholders their outlay plus a premium (Bonavia, 1987, pp. 86, 128-130).

This failure to create a publicly owned tunnel company was one of the main reasons why the French and British governments in the 1980s decided on private ownership and financing of the tunnel. According to a report written by top managers of the Eurotunnel company, the tunnel project faced several difficult and related problems that appeared because of the private ownership (Noulton, 1999). To begin with it was difficult during the 1980's to find anyone interested in owning a transportation system such as the Channel Tunnel. This created the result that the French and British governments granted the concession to construct the tunnel to a group of companies that had shown proposals regarding the construction, rather than a future suitable owner of the tunnel. The proponents to construct the tunnel consisted of a construction consortium and a financing syndicate. They got the concession without any tendering procedure and a newly set-up listed stock company became the owner of the tunnel.

It has been argued that the construction companies and the financial institutions setting up the Eurotunnel company were unwilling to commit them-

selves financially as owners of the company, leading to long-term consequences for its viability. This can be seen in the figures over the ownership of the Eurotunnel shares. In September 1986 the founding ten construction companies and five banks invested 500 million French francs in stock capital in the Eurotunnel company. In October 1986 another 2 billion French francs were invested by institutional investors. In November 1987, when the company was listed on the stock exchange, another 7.7 billion French francs were raised, to a high extent from small investors. In October 1987 a financial consortium of approximately 50 banks committed itself to a loan of 50 billion French francs to build the tunnel. At that time it was believed that the project needed 60 billion French francs. Cost increases and delays made necessary new injections of cash. In 1990, a new loan of 18 billion French francs was raised from an enlarged group of banks (220 in total). The same year the shareholders contributed another 5.5 billion French francs. In 1994, when it was evident that the project was running two years behind schedule, the banks gave a new loan of 6.5 billion French francs and the shareholders paid out 7.6 billion French francs in an issuing of new shares. The delay of two years increased the capital costs during the construction phase from 15 to 23 billion French francs (Bonazza, 1996, pp. 198-201).

The Eurotunnel company faced many types of problems. One problem was that the project was unprotected against political intervention once it had been initiated. For example, the size of the emergency exits had to be altered post-ordering, leading to cost increases amounting to 40 million pounds and a 9-month-delay (Noulton, 1999).

Another problem was that the national railway companies got the right to 50% of the tunnel's capacity but were only obliged to put in 40% of the revenues. This share was also supposed to decrease over time (Noulton, 1999). The Eurotunnel company was also unfortunate to have fixed the toll revenues for using the tunnel from SNCF and British Rail in 1987 before the company knew the true construction costs (Bonazza, 1996, pp. 156-157). From a socio-economic perspective this had a negative impact. The Eurotunnel company has tended to demand very high fees when it believes that the market can bear them. For instance, this pricing policy contributed to the decision made by Avesta-Sheffield to choose a combined railway and sea shipping solution rather than a railway-only solution (Alexandersson et al, 2000).

However, the most important problem was the immense debt and the high capital costs. The company had to borrow more than 10 billion French francs more than envisaged when the project was launched. Interestingly, the budget of the project included more than 10 billion French francs in unforeseen contingencies but this was not enough to cover higher than expected costs for

construction, rolling stock and so on and the increased capital costs due to a longer than expected construction phase. The Eurotunnel loans were to high degree long-term loans at fixed interest rates with a much higher margin than the British or French state would have paid. Bonazza (1996) claims that Eurotunnel paid 1.25-1.6 % more in interest rate than the banks paid when they borrowed the money. Since these rates were much above what became the standard towards the end of the 1990s, when the inflation rates fell in France and Great Britain, the costs of capital remained high while it was not possible to compensate for this with higher prices.

The debt problem became permanent after the launch of the tunnel system when it became evident that the company just made break-even instead of making a big positive cash flow from year one to pay the capital costs (Bonazza, 1996, p. 43). A notable point is that the revenue projections were extremely optimistic. In 1988, Eurotunnel forecasted 30.7 million passengers and 15.5 million tonnes of freight passing through the tunnel system from 1993 (in the Shuttle or Eurostar trains) (Bonazza, 1996, p. 33 and Bonavia 1987, p. 149). In reality, the passenger and freight flows were much more modest. 1.2 million tonnes of rail freight passed through the tunnel in 2007 as opposed to the forecast from 1990 of 12 million tonnes for 2003. The Eurostar trains carried 8.3 million passengers in 2007. Although this made for a market share as high as 71 % on the line Paris-London, it is nevertheless a far cry from the 1989 forecast of 21 million passengers for 2003 (Holliday et al, 1991, p. 132). In 2006, Eurotunnel earned 793 million € (5.3 billion French francs) which is still much less than the 7.3 billion French francs expected for the first year of operation during the planning stage (Bonazza, 1996, p. 43 and Bonavia, 1987, p. 149).

Yet another factor that kept revenues from rising was the fact that the new high-speed line on the English side – the link from the Channel Tunnel to London – was delayed by 8 years, not being completed until 2007, i.e. more than 10 years after the start of the tunnel services. The construction (in itself a PPP project) lost many years while private firms and the British state negotiated how the private sector could get an adequate return on its investment. When the discussions started, some actors thought that building permits and shopping facilities in the vicinity of the railway line would entice the private sector to accept most of the infrastructure investments. These incentives proved to be insufficient considering the magnitude of the investments and the uncertainties surrounding both the number of trains and the value of the properties that could be built as part of the agreement. Kain (2002) discusses this project in more detail.

The airline industry has also been able to keep a rather large share of the traffic between Paris-London and Brussels-London, partly since many pas-

sengers want to continue with connecting flights, and partly because new actors like EasyJet have entered the market and forced the established firms to lower their prices and develop their services (Commission of European Communities, 2004). Nevertheless, the number of passenger travelling with the Eurostar has increased in a rather healthy way, but it has been achieved by means of low prices and rebates.

In summary, the economy of the Eurotunnel project was destroyed by four main components. Firstly, the interest rates became fixed at too high long-term levels. The tunnel is now generating a surplus before financial costs, but large deficits once the interest is paid for the 9 billion Euro capital debts. In the triumvirate of companies handling the channel tunnel project it is clear that the Eurotunnel company and its shareholders became the losing part while the banks got their interest revenues secured at a high level and the construction companies were able to complete the project as any other large construction project. In 2006-2007 the Eurotunnel company came close to bankruptcy, but was eventually restructured into a new company, Group Eurotunnel, in a process that implied reducing the debts by more than 50% and investors trading their shares for a stake in the new company (BBC News, 2007). Secondly, the inflation rate was dampened making it impossible for Eurotunnel and Eurostar to raise their prices as expected. Thirdly, the high-speed line on the English side was delayed. Fourthly, the airlines developed their traffic and did not lose as much ground as expected.

The Öresund bridge

The Öresund bridge construction project was one in which two national states (Sweden and Denmark) took over the bridge once it had been completed by a private consortium. Although being primarily a publicly procured project, it nevertheless shares some characteristics of PPP projects of the Design-Build type. Since it also involves direct payments from the end-users (rather than by means of taxes as commonly used for road infrastructure in these countries) we have chosen to include the project among the PPP cases in this paper.

In March 1991, the Swedish and Danish governments signed an agreement concerning a fixed connection over the strait called Öresund. In January 1992, the Öresund construction consortium was formed by means of a contract between the Danish state-owned company A/S Öresundsförbindelsen and the Swedish state-owned company Svensk-Danska Broförbindelsen Svedab AB. The two companies each have a 50% stake in the consortium.

The bridge connection was divided into large construction contracts for 1) the countersunk tunnels, 2) the artificial island in the strait, and 3) the sus-

pension bridge over the strait. In order to place a bid, the companies had to show that they had previous experience from this type of project. The consortium wanted to have only a few companies in each constellation of which one should be the primary responsible company. The projects were ordered on a design/project basis, meaning that responsibility for design, technology, choice of methods and permit applications were placed in the hands of the contractors. The consortium asked for bids that included planning and technical aspects as well as responsibility for related costs, but excluding the responsibility for financing and its attached risks. The contractors were offered index-linked compensation for their costs and the possibility to get paid in a mixture of currencies, decided at the time of signing of the contract. All loans and other financial instruments were jointly guaranteed by both the Danish and the Swedish states. Unexpected events that could not be attributed to any specific party were to be under the responsibility of the Öresund construction consortium, i.e. the contractors did not have to bear the risk of delays due to for example an extremely cold winter. In order to obtain a proper foundation for these decisions, agreements were made upon references in terms of geological and meteorological conditions (Öresund Link, 1999).

Once the bridge opened it was soon discovered that the car traffic development did not amount to the prognosticated values (while the number of train journeys developed quickly). At a relatively early stage, the consortium therefore began to lower the fees and develop new products. To mention a few examples, the car commuting travel card entitling to 50 journeys a month was lowered to 3000 SEK from 4080 SEK within a year, and the creation of a "bridge passport" at 270 SEK, entitling the owner to get discounts on single journeys.

Travelling over the Öresund bridge was considerably below the expected levels during the first years. The forecasts were then adjusted, primarily by means of extending the establishment phase from three to 20 years. In 2004, a mere two years later than expected when the bridge opened, the annual average traffic levels reached 11.800 cars per day. Traffic volumes are now even stronger than forecasted in the year 2000 and the consortium now hopes that the 2008 levels will surpass the expectations from the time before the bridge was opened (Öresundsbrokonsortiet, 2005).

The Arlanda airport link

There were primarily three factors that paved the way for the construction of the Arlanda airport link as a BOT project in Sweden during the 1990's: worsened state finances in the beginning of the decade, the idea that a railway link

to Arlanda should be commercially attractive to run, and a wish to proceed with railway deregulation (Alexandersson & Hultén, 1998).

The Arlanda airport link project was being set up a few years after the Eurotunnel and managed to avoid some of the problems characterising the Eurotunnel project. Firstly, the government made the decision that the state should finance socio-economically motivated supporting investments. Thereby, Banverket came to pay for and build the railway part between Ulriksdal and Rosersberg and also the so-called North Bend connecting Arlanda to the main line north of the airport. Secondly, the state provided a conditioned loan of 1 billion SEK to the winning construction consortium.

The contract to construct the new line and also operate its train services was awarded by means of a tendering procedure. 30 companies showed interest in the pre-qualifying phase and then four consortiums competed for the contract. The winning consortium, including the vehicle manufacturer Alstom, built the line and then formed its operating subsidiary A-train to run the passenger services, which started in 1999 as projected. The contract with the state runs for 45 years and may be prolonged by another 10 years. It may also be ended already in 2010 if the parties reach such an agreement.

The government sought to make a clear distinction between the financial responsibility of the parties (the state and the consortium) and to allocate risks in a conscious manner. A-train had considerable freedom in terms of how to construct the line, but had to accept bearing risks associated with cost and revenues, both during the construction phase and the train operating phase. The company was therefore to bear the market risks, for example if the airline traffic did not develop as expected. On the other hand, it was entitled to compensation for cost increases caused by political decisions or unexpected archaeological excavations.

The state was committed to pay for the North Bend and 50% of the costs for connecting the Arlanda airport link with the northern main line. The state also granted a loan of 1 billion SEK to the consortium in return for its willingness to finance 75% of the total costs outside the national budget, and contributed with at least 15% (600 million SEK) by means of risk capital.

A-train committed itself to run at least four trains an hour for most part of the day and got the permission to run as much as six trains per hour. A-train pays for the maintenance of the line and for its own trains.

The project was almost completed within the budget as it had been projected in 1992 before the tender was performed. A big problem for A-train is that the airline traffic has not developed as quickly as anticipated. A-train has primarily gained travellers from the bus services, while the private journeys made by car and taxi have almost kept their market shares unchanged com-

pared to the pre-construction period. A-train finally reported a profit for the whole year of 2006, two years after being acquired by the Australian-based Macquarie Bank Group (A-Train, 2007).

A weakness in the consortium strategy, as pointed out by Hultkrantz et al (2005), is the choice to maximize profits by means of high ticket prices but a relatively modest use of price differentiation. This makes patronage levels rather healthy during peak time – despite high fares – but unsatisfactory during off-peak hours. During the weekends there are certain rebates, for example for two passengers travelling together. From a socio-economic and environmental point of view, it would be in the interest of the state to have even more travellers to Arlanda by rail, but the contractual arrangement with A-train has not taken this into account.

According to the contract, other operators than A-train may also stop at the Arlanda stations, but in that case they have to agree on paying a fee to A-train. So far, this has limited the actual implementation of additional train services to and from Arlanda. For the commuting services between Arlanda and Stockholm's central station A-train essentially holds a legal monopoly. A peculiarity that strengthens this even further is that the consortium was allowed to construct a platform for its trains at the central station with a unique platform height, allowing direct step-in from the platform to its trains but at the same time making it more difficult to use other rolling stock.

The Östgöta railway link

The Östgöta railway link is the name of a planned new 150 km double-track railway for high-speed trains between Södertälje (south of Stockholm) and Linköping. In 2001 the municipalities affected by the line formed a consortium to support the realisation of the project. In 2003, Banverket initiated its investigation for the line. The link is often mentioned as a part of a much larger project, the Nordic Triangle, that seeks to connect the three major cities of Sweden by means of a modern railway network.

The Östgöta link is mentioned in Banverket's (the National Rail Administration) long term planning document, with an estimated time of construction start of 2010-2015. However, in 2005, initiatives were taken by the national government in order to examine whether it would be possible to bring this project forward. The result was a report presented in late 2006, suggesting that overlapping the sequential parts of the planning process to create a parallel (rather than linear) planning process would cut the planning time substantially (Näringsdepartementet, 2006). It was also argued that a PPP arrangement could be favourable, drawing (among other sources) from an

earlier study of ours (Hultén & Alexandersson, 2006). In the following text, we will revisit some of the contents of that particular study.

It is commonly argued that a PPP solution is a way to bring forward the construction start of a certain project when national budget constraints may otherwise introduce a delay. As has been discussed above, PPP solutions are also favourable by means of standing a better chance of being completed in time. What we want to add to this picture is why an early completion in itself may bring some additional advantages. One of the main arguments for the Östgöta railway link is that it will lead to shorter travel times between the cities along the lines which will form the basis for a regional expansion with a number of spin-off effects – expanding the labour market near Stockholm, reduce unemployment, increase the real estate and land property values etc. An early completion would of course make it possible to obtain such positive effects earlier, but we also argue that some effects coming from the construction of the Östgöta link will be more pronounced if the project is brought forward or even presupposes an early finalisation. In order to affect or offset certain trends, such as migration or business cycle dependent parameters, the actual point in time for the completion of the project may become particularly important.

Some local and regional companies may have specific needs that presuppose a fast completion of the Östgöta railway link. The new line will include a connection to the airport Skavsta. This airport has the potential to become the much discussed major airport south of Stockholm (an important complement to Arlanda). However, such an expansion may be dependent on that a fast railway connection to Stockholm is completed within a few years time rather than later. Otherwise, other airport locations may be necessary to consider, but these alternatives may turn out to be costly. Moreover, if Skavsta quickly comes out as the only alternative, it would become possible to close the Stockholm city airport Bromma, making way for new homes and working places in a rapidly growing part of Stockholm. The time aspect is critical here since the current concession for Bromma ends in 2011. This option now seems to have disappeared, following a recent decision by the right-centre political majority in Stockholm to prolong the Bromma agreement to 2038 (Stockholms stad, 2007).

Analysis and conclusions

When carried out successfully, PPP projects can be very powerful tools to quickly construct new infrastructures and operate them efficiently. However, experience has also shown that they may sometimes go wrong, for example

creating transportation systems that are inefficient, under-used and loss-making.

The possibility for an earlier launch and completion of a project is one advantage with a PPP arrangement that is explicitly or implicitly recognised by researchers that analyse PPPs. Drawing from the case of the Östgöta railway link, we have developed the timing issue in some more detail, seeking to trace all the relevant public advantages (disadvantages) of initiating an investment earlier. When all these issues and arguments are combined, a strong case can be made in favour of organising a project as a PPP arrangement.

The asymmetric nature of the possible outcomes of PPP projects seems to be one source of several problems in these types of projects. A PPP project will only be really successful if it is able to generate net profits for the private sector participants. When the project instead results in losses, the private sector will ultimately withdraw, leading to a termination of the project unless the public sector steps in and increases the payments to the private partner or reclaims the responsibility to finish the project. Therefore, private sector partners rarely find themselves locked-in, while this is a common outcome for the public partner.

PPPs have been used or tried in a couple of important train projects in Europe. The most famous example is the Channel Tunnel that connects the French high-speed railway network with the British high-speed railway to London. This project has not been economically successful, mostly because of lack of foresight of the management team that negotiated the debt of the Eurotunnel company. The managers accepted to lock-in the interest rate on the historical interest rates for a fifty-year period rather than renegotiating the debt at decided time intervals. They were effectively banking on continued high inflation in Great Britain and France that would enable the Eurotunnel company to raise prices as fast or faster than the interest rate. This was a questionable forecast in light of the slowing down of the inflation in the late 1980s and early 1990s, and turned out to be impossible to fulfil. The politicians and regulators have been passive bystanders as the Eurotunnel system has been underutilised and over-priced and wealth has been redistributed from mostly French private shareholders to the same financial institutions that locked-in the future of the company and took the shareholders as hostages. Bankruptcy was the best option from early on but no politician or regulator could force it as long as the small shareholders kept the dream of making fortunes on their shares.

The Swedish Stockholm-Arlanda airport link was eventually constructed and partly financed by private capital in a PPP. In this project, that was negotiated later than the Eurotunnel deal, the Swedish state used a tender to find the best private partner. However, as the project moved towards decision, the

state had to accept larger and larger shares of the costs to make the private investment attractive. The state financed and constructed a longer part of the line than initially planned and also offered a loan of one billion SEK to the winning consortium. Despite of this, the privately-controlled railway services from Stockholm to Arlanda remained loss-making for many years and the ticket prices are extremely high by Swedish standards. The outcome has been dismal from a welfare point of view with a low modal market share for the trains. The possibility to renegotiate the contract in 2010 is in line with the need for flexibility as argued by theory and other empirical cases, but lock-in factors such as the unique platform height may still make it costly to for example change the private partner or improve interoperability with the rest of the railway network.

The Öresund link demonstrates that a welfare optimising strategy aiming at increasing the utilisation of an infrastructure can give positive effects for the long-term profitability of the infrastructure. This way of attracting increased usage by price discrimination could easily have been introduced on the Arlanda Express and to some extent on the Eurotunnel. But the rent-seeking behaviour of these firms made it unfeasible and the public partners had no bargaining power to force a change in strategy.

Moving forward

Looking forward, we suggest that a methodology is developed to evaluate the importance of bringing forward certain investments by using PPP-projects. To alleviate the potential adverse effects of PPPs – lock-ins, hold-ups and hostage-taking – we suggest that guidelines are developed for risk-sharing, compulsory renegotiations and the balance between socio-economic and private economic goals. In a European context, such guidelines could be provided by the European Commission (possibly in cooperation with the European Investment Bank) with the purpose to improve the implementation of PPP projects in the transport sector. It should also be fruitful to further consider how to avoid the special problems that relate to the relationships between different private partners taking part in the same PPP project, rather than only the relationship between the public sector and the private sector.

One way to diminish the asymmetric conditions for public vs. private partners in a PPP project would be to increase the exit costs for the private sector. For example, construction companies and financial institutes could be obliged to financially guarantee (by surety bonds or other types of binding insurances) a project's continuation even in situations of distress. Such an obligation may have helped to avoid some of the financial problems encountered by

the Eurotunnel company. Another option could be to introduce a contract link between different projects carried out by the same private sector company. If one PPP project fails, the private sector partner could be forced to also give up its other (successful) projects of a similar nature. Such a system is currently in place for the re-franchised train operation contracts in Great Britain.

As a final word on policy, the principle driving forces behind new PPP arrangements should not be short-term national budgetary constraints or to identify projects that can be attractive for private investments. Instead, projects should be chosen where a PPP project solution provides a favourable mix of productive efficiency and allocative efficiency and makes proper use of the relative strengths and merits of both the public and the private sector.

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Part 3. Concluding chapter

Conclusions and discussion

Introduction

In this final chapter, I will first present a rather brief overview of the main conclusions to be drawn from the seven essays. After that, I will return to my research questions and some of the theories and material presented in the introductory chapters of the thesis, and discuss related key findings as well as some of the issues and insights that have either come to me gradually during my years of research or have not been possible to include in the framework of the articles. In order to provide a synthesis of the findings, I will also make a comparison between the two industrial sectors studied (and how they relate to some other industries). Towards the end, I will summarise the theoretical and normative implications of my findings and highlight some additional issues that I find worthwhile to discuss.

Article overview

Tendering of bus services

The two articles on bus deregulation (i.e. the introduction of competitive tendering in local and regional bus services), focussed on exploring the spread of competition and measured some of the direct and indirect effects by means of econometric analyses of statistical data. The first article, covering the period 1987 to 1993, concluded that tendering had had a direct cost-dampening effect for the procuring CPTAs in Sweden's counties, when controlling for the change in supply. It was also shown that in order to achieve the cost-effect from tendering, it was preferable to tender whole regions rather than hoping for substantial indirect effects between tendered and non-tendered areas. Furthermore, in line with other studies, the increased role of private ownership could not explain the cost reductions better than competition. Travel-data was also analysed. The reduction in demand that was apparent in many counties seemed to be unrelated to the reform as such. The second article, which covered the extended period 1987-2001, confirmed the significant effect of first-time tendering on costs, although, when looking at the whole period, this effect turned out to be smaller compared to what was expected from the results of the earlier study. In the early 2000s, the sector had entered into a new stage of development. Most municipality-owned companies had disappeared and big private firms had become part of

international conglomerates. Competition was still fierce, making the outcome of tenders unpredictable, and, worryingly, many companies were showing losses, despite increased levels of compensation in the contracts. There had also been problems with companies bidding lower than was commercially viable. Experiments with different types of incentive-based contracts had initially seemed as a possible way forward, but simple gross-cost contracts continued to dominate. By 2001, almost all bus services in Sweden had been tendered at least once, and it seemed plausible that the cost-dampening effects of tendering had been exhausted. As already mentioned, regressions indeed showed somewhat smaller savings from tendering for the period as a whole, but it could also be argued that the modelling could not capture all the cost effects, as restructuring and cost reductions had taken place in several counties before tendering started (in order to prepare for tendering). Moreover, the impact of quality improvements such as faster fleet renewal was still unclear.

An overall conclusion from the bus papers is that the introduction of tendering clearly initiated a long period of major restructuring in the industry. Private companies have come to dominate an industry long-dominated by municipality-owned companies and vertically integrated firms. Furthermore, the market has become much more concentrated, although there still seems to be room also for smaller firms.

Reforms in the railway sector

The third paper tracked the deregulatory path of Swedish railway reforms from 1988 to 2006 and presented the new regulatory structure and its relevant actors. It was concluded that the reform process originated out of national needs and problems rather than influences from, e.g. the EU. At later stages, European developments started to become more important. The degree of competition and new entry was analysed in the article, and it was concluded that a number of new entrants (both passenger and freight operators) had appeared. Nevertheless, SJ and Green Cargo still dominated most part of the markets. Relatively few bidders had been active in the tenders, although this number had tended to increase in recent years. It had also been difficult for the incumbent SJ as well as other actors to defend their contracts in new tenders, a finding which defied the conventional presumption that that previously established firms benefit from better knowledge of the market and of the costs of production.

It was concluded that competitive tendering had resulted in clear effects on subsidies: transport authorities' compensation to contracted operators decreased by around 20 per cent in early tenders. In some cases, substantial reductions had also been possible to achieve in later tenders. Travel was

shown to have increased greatly during the period of reform, but this might have been attributable to upgrading and investments in infrastructure and rolling stock. Vertical separation, rather than competition, had made it possible to direct more public money to rail infrastructure investments. The third paper also highlighted the finding that decentralisation of responsibility had led to an upswing for local and regional passenger services.

The fourth paper took a closer look at the Swedish railway reforms in an international context. The focus in this article was on competitive tendering and privatisation and related effects, making direct comparisons with the cases of Great Britain, Germany and the Netherlands. The article also included an overview of market opening and new entry in all the 27 EU member states. The observation was made that reforms typically had sprung out of necessity, and had been implemented in a step-by-step manner. Competitive tendering (or the threat hereof) had generally led to a reduced need for subsidies, an improved cost efficiency and in some cases also innovative practices from the new entrants. Unfortunately, problems with strategic bids or too few bids had also occurred in several countries. In the four-country comparison, the relatively late and modest reforms of the Netherlands had resulted in a relatively less favourable outcome. The UK model of privatisation, also including track infrastructure, was concluded to be too radical, or in need to be balanced by other regulatory measures to provide the appropriate incentives.

The fifth and sixth papers highlighted various problematic aspects of bidding behaviour in tenders. In the first of these papers, the concept of predatory bidding in tenders was developed, building on theories of predatory pricing and the winner's curse concept in auction theory. It was argued that in the case of public procurement, a predatory bidding strategy can be a successful way to limit future competition, as there may be limited possibilities for a losing firm to stay in the market until the next tender. At the same time, it is a risky strategy and, when it back-fires or results in unmanageable losses, can lead to market withdrawal or service disruptions, which typically causes severe problems for end consumers, not least in the public transport sector. A general need to reform competition laws (and their application) was identified in order to tackle the problem of strategic bidding. The other paper further explored the appearance of both very low and very high bids in tenders, theorized regarding the possible explanations (and developed categories) for various patterns of behaviour as well as the conditions under which some firms would be more or less likely to place bids like these. An empirical data-set was used to test a couple of hypotheses. It was shown that both very high and very low bids had clearly been present in several tenders, and it was possible to categorise them in accordance with possible explanations. In some cases, strategic bidding, and even multi-period

strategic games seemed to have been practised. In line with one hypothesis, large oligopolistic firms seemed more likely to place extreme bids in tenders. It was also suggested that a general lack of transparency in the tendering procedure, not least regarding the failure to publish the bids after the tender, might facilitate and even increase a bidder's perceived gains from using a strategic bidding strategy.

The seventh and final paper explored alternative ways to increase private sector involvement in the transport sector, looking in particular at the role of public-private partnerships (PPPs). After discussing the typology of PPPs and building on existing literature concerning advantages and disadvantages of PPPs, it developed a discussion on incomplete contracts and lock-ins as possible reasons for why PPPs sometimes go wrong, and how such problems can be avoided. A number of case studies from the Swedish and European transport sectors were used to illustrate the use of and experiences from PPPs. Drawing from this, the relevance of timing was developed in a discussion on how PPPs may provide for an earlier launch and completion of a project. The presence of asymmetrical conditions for exit between private and public partners was identified as an underlying source of lock-in and related negative outcomes in PPP projects, and various ways to handle this were suggested. As a final word on policy, the paper stressed the need to recognise that new PPP arrangements should not be seen as solutions to short-term national budgetary constraints, but rather be considered interesting options only when they stand to merge the relative strengths and merits of both the public and the private sector.

My research questions revisited

In the first introductory chapter I stipulated that this thesis has several aims and deals with a number of issues. I also summarised and categorised the issues of interest into two basic research questions:

1. What are the initiating and driving factors behind the reforms?
2. What are the effects of the reforms?

In addition, I stated an over-riding research objective, which would follow from (answering) these two basic research questions: To generate some theoretical as well as normative lessons regarding regulatory reforms in these and other sectors.

The questions above have already – to some extent – been answered in the essays, as summarised above. However, a number of these answers can be developed further by means of combining the various findings and observations, also drawing from the introductory overview of the reforms

processes, the context, and the theoretical framework. It will also become evident that the arguments developed during a discussion of the research questions will feed into a concluding discussion around the theoretical and normative lessons to be made.

Initiating and driving factors behind reforms

A very important issue for me has been to look thoroughly into the question of why a certain reform happened in the first place, and what kind of driving factors have been important in the further development of reforms.

Initiating factors

Intra-modal competition was introduced roughly simultaneously in Sweden for bus transport (1987) and for rail transport (1989), resulting in new entry and a restructuring of these sectors that continues to this day. It would be too simplistic to just apply neo-institutional organisation theory and argue that this happened because there was a general movement towards deregulation, privatisation and other reforms intended at market opening. Rather, I argue that the initiating factors were a number of perceived industry-specific problems at the local and national levels. Later on, the institutionalised environments (Brunsson & Olsen, 1993) and contextual developments, both nationally and internationally, did play significant roles, but these were not critical to getting the process started.

I have shown in chapter 6 of Part 1 that in both the bus and railway sectors, these reform processes have a long pre-history. In the case of the bus sector, it had become increasingly problematic for local and regional authorities (municipalities and CPTAs) to efficiently carry out their work of coordination of public transport services. The old line-based licenses held by individual bus companies were viewed as obstacles to developing the bus services as a whole. Moreover, subsidies had tended to increase uncontrollably as the CPTAs had very limited negotiating power. One solution was to simply acquire the private bus companies in question (including their licences) and create larger public bus operators (as some CPTAs in fact did), but the 1985 Government Bill clearly set out to attack the perceived root of the problem and provide more room for manoeuvring. Although highly criticized at the time – as it was believed that the reform might lead to CPTAs integrating all operations into their own structures and forcing private companies to exit the sector, it came as a surprise to most observers that the early adopters among the CPTAs instead opted for competitive tendering, and that this move actually favoured an expansion of private companies at the expense of public operators.

In the rail sector, SJ's persistent problems in achieving profitability, the need to invest more in rail infrastructure without cross-subsidising operations, and the perceived success of the road-sector model of organisation, ultimately led to the 1988 vertical split of railway infrastructure from operations.[14] A ground-breaking reform in itself at the time, it came to have consequences far beyond what most observers had imagined. It was not intended to be a first step towards deregulation and competition; nevertheless, in combination with the decentralisation of responsibility for local and regional train services (made with the intention to delegate responsibility to those most affected by these services), and the funds and rolling stock to run them, tendering of rail services was suddenly made possible. The CPTAs, especially the ones that had already dealt with SJ as a contracted operator and had some experience in tendering bus services, were eager to make use of this option. When this led to an early winning bid from a new company – BK Tåg – it suddenly became clear that the old monopoly was about to crack.

Alston (1996, p. 25) has stated that "the dynamics of institutional change frequently include unintended consequences that take on a life of their own". In both the Swedish bus and rail sectors I have found evidence to conclude that the initial reforms were not intended to lead to market opening or deregulation. This holds in particular for the railway sector, as has also been observed by Nilsson (2002). However, it did not take long before it became clear that – accidentally – market opening and deregulation were what had really happened as firms and other organisations explored the new opportunities created by vertical separation and decentralisation. Consequently, I call this an *accidental deregulation*. Moreover, this came to define a new order that all the subsequent reforms had to take into consideration. The deregulation of the bus sector also has accidental, unintentional consequences. At the time, even if competition was foreseen as one of several options being made available through the abolition of bus licenses, the focus of the law-makers clearly lay elsewhere. The rapid early introduction of competitive tendering – and its spectacular results – came as a surprise. A few years later, competitive tendering – whether applied or not – was a defining element in the restructuring of the whole industry.

[14] It should be noted that the discussion and arguments made by Brunsson *et al* (1989) and Brunsson & Olsen (1993) about this reform focus on the intentions and efforts to make SJ more business-like, but do not address the actual implications of the vertical split of operations from infrastructure.

Drivers of continuous change

After the initial steps towards regulatory reform followed a period of change and additional reforms, leading the markets to become increasingly open to new entrants. I have come to recognise a number of driving factors supporting this progressive development, as well as why one practice in particular – competitive tendering – became such a dominant feature. In this analysis, I have found it useful to view the reform process as one of institutional change, and have drawn on the frameworks and theories provided both by new institutional economics and neo-institutional organisation theory in my attempt to explain what has happened and why.

As presented in the theoretical framework in Part 1, North (1990) has stressed that institutional change – which is typically incremental by nature – comes from the perceptions of entrepreneurs in political and economic organisations that they could do better by altering the existing institutional framework at some margin. Alston (1996) has then suggested that institutional change can be considered the result of interplay between demanders and suppliers of institutional change. According to this view, institutional change should therefore be possible to understand better by means of identifying these demanders and suppliers, and revealing the power relationships between and among them.

The government and parliament have clearly been the main suppliers of institutional change over the whole period, at least when considering the formal institutions. However, they have seldom taken initiatives truly on their own, but have instead, generally been influenced by or forced to react by the demanders. The prime exception to this was the attempt of the non-socialist government to deregulate the entire railway industry in 1994. To a much greater extent than other changes, this was the product of political ideology, and gained strength from the world-wide movement to deregulate and liberalise industries where public ownership and involvement had dominated. The suggested changes were also radical rather than incremental, which may explain why they did not survive a political shift in power.

Among those who demanded institutional change, I recognise the following key actors: SJ, the Competition Authority, Banverket, the CPTAs, the state's procuring agency, and among the new operators primarily BK Tåg, LKAB and Tågkompaniet.

It is evident that SJ's management for long had considerable power to influence regulations in both the railway and the bus sectors, and was keen and able to use it, constantly asking for revised regulatory conditions in order to improve profitability. SJ's deteriorated finances repeatedly formed the impetus for suggested institutional changes. A common governmental remedy for SJ's problems was to grant SJ more subsidies. Closing lines was

seldom a realistic political option. Local opinion against line closures has traditionally been very strong, but more importantly, this opposition gradually grew more well-organised, represented by local political authorities.[15] Later, these authorities became even stronger, as they became the actual buyers (although not end-users) of passenger services. SJ's power to induce institutional change reached a climax in 1988, when the company was relieved of the costly responsibility for track infrastructure (something that also made it much easier for politicians to increase public spending on infrastructure, since it would then not be viewed as subsidises to SJ). However at the same time, this also meant the beginning of the end of SJ's ability to gain additional subsidies. The appearance of public procurement of railway services by competitive tendering, one of the indirect effects of the Act of 1988, initiated developments that in the long run came to undermine SJ's position. Today, SJ has lost most of its power to influence the direction of regulatory changes. In the year 2000, it was only by means of several concerted actions that SJ was able to block the further tendering of the West Coast Line (see further below).

As SJ's influence on national regulations has diminished, the role of the other key actors has increased. The Competition Authority, representing the demands of freight customers and other end consumers, has tried to lobby the government to lower the entry barriers for new operators by stripping SJ of some of its critical assets, and has also argued for the abolition of SJ's exclusive rights related to the market for profitable passenger services (Konkurrensverket, 1998). The Competition Authority has also actively supported the deregulation of long-distance bus services and continued efforts to open up local public transport markets to more competition (Konkurrensverket, 1996). It has sometimes had a hard time making itself heard, especially during Social Democratic governments, but the authority has nonetheless been a source of arguments used also by other actors. Moreover, the Competition Law of 1993 gave the authority a more powerful enforcement mechanism, especially for the prevention of abuse of dominant position, which the Competition Authority put to a test in the court case regarding SJ's winning bid over its competitor BK Tåg (as discussed in the article on predatory bidding).

While the state, as well as state-owned SJ, has increasingly transferred the burden for unprofitable railway lines to the regional authorities (CPTAs), the latter have protected the perceived interests of ordinary end-users by for example maintaining railway services and making it relatively affordable to travel by train and bus. They were also instrumental in the reform to abolish

[15] In effect, these well-organised local consumer groups were able to win at the expense of the more diffuse group of all taxpayers.

the old bus-operator licences, while through the use of competitive tendering they have lowered the entry barriers for new train and bus operators. Collectively, the CPTAs have often lobbied in favour of continued railway deregulation, at least as long as this would imply more opportunities for tendering, while they have been less favourable towards a completely deregulated market, characterized by open access (both for rail and bus). Another important actor in this respect is the state's agency for procurement of services on the inter-regional lines. This agency has been an advocate for the creation of equal conditions between SJ and other operators in terms of access to common functions and rolling stock. Learning has played an important role in this regard. Over time, the procuring agency grew more skilled at evaluating SJ's real costs of production, which influenced the government to have SJ lower its requested price when renting vehicles to other operators.

Banverket, once it had become truly independent of SJ, has often sided with the new train operators, especially the freight operators, which has affected the implementation of the deregulation of this part of the market. The mining company LKAB was successful in getting operating rights of its own as early as 1993, despite the opposition of SJ. In part, this can be accounted for by the support of Banverket.

Following its entrance into the railway market in 1990, the operator BK Tåg spent a number of years fighting for lower entry barriers and the subjection of more lines to tendering. With the help of the Competition Authority, it fought for fair conditions in tenders, putting constraints on SJ's future behaviour. Through its alliances with the international conglomerates Via GTI and Go Ahead Group in the companies Sydvästen and Citypendeln, it further challenged SJ's position and the regulatory system as a whole. In 1998, Sydvästen placed a zero-subsidy bid in the tender for the West Coast Line, doing something no one had expected. Despite being within the limits of the regulatory framework of the time, this turned out to be a most serious threat against the remaining parts of SJ's legal monopoly. In the end, SJ managed to stave off this threat, by seeking new alliances (the Norwegian state-owned monopoly operator NSB) and lobbying the government to make use of technicalities in the contract; but SJ's victory came at the cost of a new government policy stating that in the future, once a line had been tendered, SJ would no longer have the right to take it back into its commercial domain. In recent years, the train-operating company Tågkompaniet (initially an upstart maverick but later a subsidiary to NSB) has been one of the most visible advocates of further reforms. On the other hand, in the bus sector, it was primarily the minor operators that asked for a deregulation of long-distance bus services, as the dominant operator Swebus remained a subsidiary of SJ until 1996.

What about the power of the general public to influence the direction of institutional change? As has been mentioned above, public opinion, helped by the power of local authorities, has been an important factor in the retention of unprofitable services, helped by the power of local authorities. In other respects, it seems as if the public for long was unaware of the extent and implications of the regulatory changes in the Swedish railway industry during the 1990s. One reason may have been the rather limited number of occasions when different political ideologies became apparent. All this changed with the massive in-flux of new operators in early 2000, and the problems some of them (Citypendeln and Sydvästen) had in terms of fulfilling their contracts. Suddenly, people came to realise that SJ was no longer synonymous with the Swedish railway industry.

In addition, it is clear that the effects upon *economic performance* caused by previous institutional changes have played a very important role for later institutional changes (North, 1990, pp. 94). The experiences from the cases where CPTAs were early to take an extended responsibility for the regional railways made way for a general policy of decentralisation in 1988, which was taken even further in the 1990s and 2000s. When it comes to the spread of competitive tendering, performance effects seem to have been particularly important driving factors, as will be discussed further below.

Following from this analysis, the process of institutional change in Swedish rail and bus sectors appear to be closest to the model suggested by Setterfield (1993, pp. 761), who states that institutions tend to be exogenous for the actors in the short run, but endogenous in the long run, implying institutional stability punctuated by short periods of substantial change. There may be a constant pressure for change, but this is to some extent counterbalanced by inertia and conservatism. However, one important empirical observation must be added to this: In terms of influence upon regulatory changes, the time factor also means that the relative powers of those demanding and supplying regulatory change shift over time. Some institutional changes have clearly reduced the power of certain demanders, with SJ being the primary example.

The diffusion of competitive tendering

Related to the discussion on driving factors behind reforms is how these reforms are spread or diffused. While the interplay between demanders and suppliers of institutional change has been dealt with above, we have so far not discussed why competitive tendering turned out to be such an important part of the regulatory framework in the Swedish railway sector. This is the purpose of this section.

It is obvious that the practice of public procurement by competitive tendering has a long history in Western society. Demsetz' (1968) develop-

ment of a franchise-bidding framework as an alternative to regulation of natural monopolies can actually be traced back to works by Chadwick in the 1850s. Over time, possibly through *theorization*, it seems to have gained the status of an institutionalised model, making diffusion easy (Strang & Meyer, 1993). At least three different justifications for competitive tendering can be identified, and these appear to have had different importance in different times and places: 1) cost efficiency, 2) fairness and market opening, and 3) elimination of corruption. While EU directives and policies have often focussed on the first two issues, the third issue has historically been important in the U.S.[16] Cost efficiency seems to have been very important in Sweden from the beginning and onwards, closely linked to the desire for a more coordinated public transport network. Fairness and market-opening did not really enter the equation until new entrants had already appeared and Sweden's legislation was changed to better comply with the EU. The issue of corruption has rarely been mentioned in arguments for competitive tendering *ex ante*, but has occasionally been brought up (in other business sectors) in the wake of a scandal, when it has been revealed that competitive tendering has *not* been used or when the tendering conditions may have been designed to benefit a certain supplier (so-called wired competition).

Public procurement by competitive tendering made its first appearance in the Swedish transport sector when some CPTAs started to make early use of their new possibilities for coordination of contracted local and regional bus services. The maps in Appendix 3 show how the practice of tendering for bus services was initiated by a couple of pioneering neighbouring counties in 1987-88. By the end of the 1990s virtually all bus services had been tendered at least once.

In addition, triggered by the decentralisation of financial responsibility to the CPTAs, the very first tenders of regional railway services took place in 1989. This happened in the very same counties that had already successfully pioneered tendering of bus services, and could be seen as a natural transfer of the practice to another line of the CPTAs' businesses. In an international context, these were clearly very early examples of competitive tenders of railway services, preceding any initiative in this direction at the EU level.

The performance effects seem to have been particularly important when it comes to the further diffusion of competitive tendering. Some spectacular cost-savings of early competitive tenders and new entries made more CPTAs consider this practice, probably facilitated by the fact that the CPTAs were already so institutionally isomorphic (Dimaggio & Powell, 1983) and eager to imitate each other. Interestingly, the experiences of the early adopters

[16] This assertion draws from a discussion with Professor John Meyer in early 2000, related to the PhD course "Organizations and States in the Modern World Context".

among the CPTAs also directed national policy towards making procurement of rail services by competitive tendering even more wide-spread. Thereby, the practice was diffused in the direction from the regional level up to the national level. It also seems that the Competition Authority played an important role here, providing theorised arguments for competition based upon gathered experiences from tenders in Sweden and other European countries.

The Swedish experience of competitive tendering of rail services, and the whole idea of vertical separation of infrastructure from operations, clearly also had an international impact. The UK reformers took the Swedish experience into consideration before restructuring the UK railway sector, and the EU initiative (by means of directive 91/440) to reform the European railway sector was based upon a model of vertical separation pioneered by Sweden. Also, the Swedish decentralisation and regionalisation movement appears to have inspired other countries such as Germany and France.

Over time, competitive tendering became the institutionalised way of procuring non-commercial services in the Swedish transport sector. One important step in this process was the changes in national legislation connected to Sweden's harmonisation with EU. Although these changes (at least for the transportation sector at the time) were primarily designed to bring legislation in line with practice, they were nevertheless important since they included theorised, rationalised arguments for why competitive tendering should be carried out. They also made the further diffusion of competitive tendering seem legitimate. In effect, it became easier for CPTAs to choose tendering without much debate, while the authorities that chose not to tender had to argue vigorously to defend this position. Ultimately, almost everyone succumbed to the established norm of competitive tendering.

In summary, the practice of competitive tendering, having started with local and regional bus services, initially spread from one region to another. Very soon it also came to be used in the railway sector, thereby diffusing across industries. The impact influenced politicians at the national level, taking the practice further, from local/regional to national level. From then on, it came to be used in more and more segments of the regional traffic and ultimately also affected policy developments in other European countries.

History and path dependence

The spread of competitive tendering, as well as the general development of reforms in the Swedish bus and railway sectors, may also be analysed by means of other, history friendly approaches from new institutional economics and literature on technological development (North, 1990, David, 1985 and Arthur, 1989). In its weaker sense (Magnusson & Ottosson, 1997), the concept of path dependency can be used to describe a development in which

"history matters" or even only "circumstances matter". This is definitely possible when analysing the process of regulatory changes in the Swedish railway sector. Once the practice of competitive tendering had been applied for bus services, it became relatively easy to extend that policy to rail services and more and more parts of the network. Decentralisation is another policy application with similar characteristics. Even SJ's behaviour of continuously asking for better conditions may be described as path-dependent. Clearly, it seems as if even small steps along the path of deregulation, have been highly uni-directional. Even shifts of power in Parliament have not prompted reregulatory moves to recreate a previous framework. Consequently, the development and changes have been close to irreversible (or quasi-irreversible), with the exception of radical proposals for change not yet applied.

In its stronger (original) sense, path-dependency theory implies that once a choice has been made, a specific path is followed due to increasing returns, even when this may lead to non-optimal outcomes. The establishment and diffusion of competitive tendering for the procurement of railway services may include some elements of path dependency in this respect as well, since it became easier and easier to employ this practice without need for arguments, and thanks to organisational learning. Competing institutional solutions were excluded from consideration and perhaps even from the cognitive space. It may therefore be argued that vertical disintegration, decentralisation and the introduction of competitive tendering was not necessarily the optimal path to follow from a strictly economic-efficiency perspective, especially when we consider the costly halting of line closures and the increased total subsidies to the sector that followed. However, it is clear that considerable gains in efficiency (at least locally) have been possible to achieve when the scope for optimisation was narrowed down to bus and train operations rather than, for example, seeking to optimise the old vertically integrated monopoly as a whole. One may also argue that under the vertically integrated monopoly of "old SJ", the pressure to rationalise and optimise overall production was not severe enough. For SJ, it was probably easiest to improve finances by means of seeking additional state grants and subsidies, especially since line closures were so difficult to achieve.

Although competitive tendering became the chosen path, it is necessary to stress that a considerable amount of variety is still allowed within this institutional frame. The procuring agencies are continuously experimenting with pre-requisites and conditions placed upon bidders, on the length of contracts, on the types of contract (cost-based only or based upon net revenues) etc. Seeking optimal solutions has never been the objective; rather the system has been designed to allow for continuous change and variety, within the limits of the institutional framework. Does this mean that path-

dependence in this case has caused a lock-in to an institution that albeit from the start is better at selecting efficient solutions, but eventually will lead to inefficient outcomes? One could argue that the lack of truly commercial initiatives, complementing and/or challenging the procured services, may point in this direction.

The importance of single events

In Sweden, the impact of the early entry of the entrepreneurial firm BK Tåg must not be underestimated.[17] Happening much by chance, it can be argued that this was one of the single most important events for the further establishment and spread of competitive tendering. When a deregulation is carried out, there is often an implicit belief that entrepreneurs will almost automatically take advantage of the new system and thereby make sure that the objectives of the deregulation are fulfilled. However, if entrepreneurs are rare and/or not spread out evenly in space and time, similar regulatory changes in different places or at different times may lead to very different results. History-friendly theoretical frameworks like new institutional economics and path-dependency recognise the importance of circumstances and critical events for future development. Unfortunately, these events are very hard to predict, making it difficult to take them fully into account other than in retrospect.

The effects of the reforms

The papers included in this thesis have revealed a number of effects from the reforms in the Swedish bus and railway sectors, as summarised earlier. In this section I intend to provide a synthesis of the most important ones, and also reach some new conclusions, by means of comparing the outcome in the different sectors. Following this, I will also make some comparisons with other sectors to draw some general conclusions.

Comparing outcomes in the bus and railway sectors

30 years of reforms in both the bus and railway sectors have clearly meant that these industries have been restructured in major ways, and sometimes the outcomes have been unexpected. We have seen interesting examples of actual competition and new entry, but the process, speed and character of these phenomena have nevertheless been very different from sector to sector. It

[17] The company Stagecoach probably had a similar impact on the development of bus deregulation in Britain (starting with only two buses in 1980), while RyanAir paved the way for the development of the low-cost segment in the deregulated European airline industry.

may be easier to understand these differences if we first look at the differences in market structure before the reform processes set in.

In the early 1980s, the Swedish bus sector was by and large a very fragmented market, and included a large number of small and medium-sized firms as well as a couple of rather big companies. Most were involved in local/regional public transport of some sort, but there was also some charter traffic and limited long-distance services. The ownership structure also differed widely: from private to several varieties of public ownership: municipality, county council or national state. Furthermore, some companies were closely integrated with the whole planning organisation related to public transport. There was even one case of a public bus company being integrated with local energy production. Overall, the market structure was a stable one, without the dynamics of entry and exit, mergers or expansion, but for the occasional takeover of private firms by the public sector, although this process had largely been completed in the 1970s.

In contrast to the fragmented bus sector, the railway sector was totally dominated by one major state-controlled administration, SJ, which integrated operations and infrastructure management and investments, as well as a number of related services. As an operator, SJ mostly ran services of its own, but sometimes also worked under contractual terms. Similar to the bus sector, the railway industry was stable in terms of firm-structure, but the supply was subject to changes and threats of line-closure, as SJ revised it plans of operation and investment. This caused tensions between SJ and several of the CPTAs.

In the bus sector it was initially the already rather large firms, and primarily the private ones like Linjebuss, that made good use of the opportunity to expand through winning bids in tenders, as well as through acquisitions, both directly and indirectly linked to the tendering process. For SJ's subsidiaries GDG and SJ Buss, several contracts were lost in the early tenders. In some cases these subsidiaries even competed against each other. Merging them into Swebus made it easier to control their combined resources, and this merger was therefore directly related to the introduction of competitive tendering. Nevertheless, as Swebus was the largest company and had the most traffic to defend, it could not expand the way Linjebuss did, even though it won equally often. For municipality-owned companies, tendering turned out to be a "win-or-lose-everything" situation. They were typically not allowed to compete outside of their original geographic areas of operation unless they merged with other firms. Many were quickly overtaken by other firms. The smaller private firms went through a learning process before starting to cooperate in larger structures and becoming more successful. The end result was a total makeover from a market dominated by publicly owned firms to a market where private firms prevail, the largest of

which are all parts of international conglomerates. The market structure of today can be characterised as an oligopoly, complemented with the many small companies that do still exist. The overall development has been one of increased seller concentration.

In the railway sector, the first new entrant, BK Tåg, came from the bus industry but was a very small firm. Linjebuss also tried for years to enter the market but did not succeed until 1998, while Swebus mostly refrained from competing for rail contracts (except for metro and local services in Stockholm), both before and after their links to SJ had been severed. For a long period, it was clearly much more difficult to enter the rail market than the bus market. In particular this was true for inter-regional services where SJ controlled most of the resources much longer than in regional services. An alternative route of entry was the rail-freight market, which was opened earlier and was less dependent on SJ for access to certain resources. For the dominant operator SJ, market-opening could really only mean a shrinking market share, but this was a slow process. Also, unlike the municipality-owned firms of the bus market, SJ was not restricted to competing in certain geographic areas and could also make a comeback if a lost contract was retendered.

In the year 2000, when the barriers to entry had progressively been lowered, several firms coincided in finally breaking SJ's dominance within the passenger side of the market. Today, the rail sector has similar characteristics as the bus sector, with an overall oligopolistic structure, although the total number of firms is still very limited and there is a general lack of smaller firms (except in the rail-freight business). As SJ is still under public ownership, private ownership has not become the dominant form the way it became in the bus sector.

To summarise, the initial differences between the bus and rail sectors clearly played a role in the subsequent development and impact of reforms, but nevertheless, the end result is rather similar. This outcome from the restructuring process would suggest that the importance of scale economies was probably underestimated in the bus sector, but exaggerated in the railway sector. It can also be argued – as I have done in previous studies – that market-opening and the introduction of tendering prompted a renewed interest to exploit any underlying economies of scale or scope, in both sectors. Under the previous framework, characterised by monopolised structures (in the local or national sense), the incentives to do this were very weak. In the end, it turned out that some scale and scope economies were definitely there to exploit, but the operators had to actively make use of them in order to benefit. In this regards, they also differed in their skills, sometimes going through a learning process before being able take advantage of the new opportunities. Another observation is that the different choices made by

different companies have also affected the development of the market structure. As has been indicated above, Swebus avoided most parts of the railway market but expanded its long-distance bus network once freed from the limitations of SJ's ownership. On the other hand, Linjebuss was a strong advocate for the deregulation of long-distance bus services, but once this happened it chose to stick to its contracted services.

Both the bus and rail sector in Sweden now include major international players, but this outcome was not self-evident. After the early years of bus deregulation and tendering in Sweden, Swebus and Linjebuss made use of their newly gained experience and were initially very successful abroad, making inroads in Norway, Finland and Denmark. Linjebuss also made some acquisitions in Germany and Belgium. When Swebus was privatised in 1996 and sold to British Stagecoach, the Swedish bus market was at once changing character by means of ownership, as the major firm was now controlled not only by a private – but also foreign – firm. Linjebuss entered into various collaborations with French CGEA as early as 1993 (in order to bid for a Stockholm metro contract), and in 1998, shortly after Linjebuss had finally won and started its first rail contract in Sweden, CGEA acquired Linjebuss, eventually turning it into a Connex subsidiary (now Veolia). Similar to Linjebuss, BK Tåg partnered with French and British firms to be able to place bids in bigger tenders. While BK Tåg eventually withdrew from these joint ventures, it had nonetheless helped the French conglomerate Keolis become established in Sweden. Tågkompaniet likewise became a stepping stone for NSB, and was eventually completely taken over by the same firm. As of today, not much is left by the international initiatives taken by the pioneering Swedish firms as they have all become parts of greater international conglomerates. It also seems to be the case that once any new company grows big enough it is acquired by one of the bigger firms.

Tendering has been successful in terms of bringing down the subsidies paid by public authorities in both sectors, which is similar to the experience made in other countries such as Great Britain. In particular, savings on the magnitude of 20-30 per cent were made in the first tenders, indicating a real scope for rationalisation. A number of years and additional tenders later, the possibilities for additional savings through tendering seem to be exhausted. Unrealistic or strategic bids have appeared in both sectors, but have been more prominent in the rail sector, possibly because firms have found it more difficult to enter without being prepared to take risks.

Decentralisation of responsibility for rail services is one of the most important outcomes of the reform processes, and has had several side-effects. For example, the CPTAs have worked hard to coordinate the rail services better with the bus services. But the decentralised interest in rail has also led to an interest to expand such services into other counties, sometimes creating

new regional networks. This has highlighted some of the juridical restrictions inherent in Sweden's administrative division into counties. Several counties have been merged in recent years and one of the main arguments has typically been the goal to improve coordination of regional public-transport services. Therefore, the whole reform process has also contributed to the regionalisation and regional enhancement process, assisting in a demographic shift of employees living farther away from their workplaces.

The CPTAs were not the only ones to transferring practises (such as competitive tendering) from the bus to the rail sector. The fact that some bus operators explored running train services also led to a diffusion of practises close to the operational side. The best example of this is probably how BK Tåg went into the business of the maintenance of railway vehicles and succeeded in changing the railway-specific train engines to standardised bus engines. On a more general level, it is evident that the whole regulatory framework for bus and rail services is converging to become much more similar. This is further discussed at the very end of this chapter.

One very important effect of the reformed structure of the railway industry is that spending on infrastructure maintenance, renewal and investment has increased dramatically, by a factor of 2 to 3 as compared to before the vertical separation. It has clearly been easier for the government and parliament to spend more money on rail infrastructure when it was handled by a separate authority (as in the road sector). This system has vastly improved the transparency and control over where the money is going, compared to the past practice of just granting money to cover SJ's debts without really knowing how it was spent.

Comparing the outcome with other sectors

We may now return to the table first presented at the end of chapter 5 on the contextual development in other network-type sectors, with the expanded Table 2b now also including the railway and bus markets (separated between rail-passenger and freight, and local and long-distance buses).

It can be noted that all sectors except passenger railway services and local bus services have moved from monopoly-type structures to deregulated structures where entry to the market, at least in principle, is open. This is also the case for the railway-freight market (since 1996) and the long-distance bus services (since 1998) while passenger-rail and local bus services remain in a state of *regulated* competition, characterised by tendering, despite being very early targets of the initial reforms. It is important to note that this state also means that, in contrast to the other sectors, end consumers rarely make their purchases directly from the operators. Instead, there is an intermediate authority which procures these services on a long-term basis. In other words, politicians have been much more cautious in opening up these markets and

fully trusting that the choices made by individual consumers will develop the markets in a positive direction. This is actually similar to the situation in most other European countries so apparently, public transport is still considered to be a market in need of special considerations. As has already been mentioned, Sweden may however be on the verge of turning even these markets into more fully deregulated ones.

As in aviation and postal services, the production of local bus services has decreased, but this can probably be explained by their links to local and regional rail services. As many CPTAs have focussed on investing in new trains and expanded railway services, passenger flows have been transferred from buses to trains, and the supply of bus transport has been reduced.

Rail and long-distance bus services follow the general observation of decreased seller concentration, while this does not hold true for local and regional buses, again because the market used to be very fragmented and it has paid off to form larger structures.

The fact that consumer prices following deregulation have fallen only in the telecom sector may partly be explained by the fact that this sector has probably been the one most affected by a profound technological development which also had implications for the cost structure. In rail and bus transport, there are indications that prices may have fallen in the more deregulated areas (rail freight and long-distance buses) while other parts of the market have seen shifts upwards. With this in mind, it should be noted that the prices paid by the end-consumers have rarely been an important issue in the reform process, because tendering focussed instead on the prices paid by governmental or regional authorities as procurers of these services. In the telecommunications market, on the other hand, the regulator has had a very strong focus on affecting the prices paid by end-consumers, acting strongly to influence a number of factors related to these prices, such as the prices paid by competing operators for initiation and termination fees in other operators' networks and the process of switching between operators and even infrastructure-providers.

Table 2b. Development after liberalisation in some Swedish sectors

Sector	Rail passenger	Rail freight	Local buses	Long-distance buses	Aviation	Telecom (fixed)	Telecom (mobile)	Postal services	Electricity
Pre-reform structure	Monopoly, vertical integration	Monopoly, vertical integration	Licenses	Licenses (limited entry)	Regulated oligopoly	De-facto monopoly	Regulated competition	State monopoly	Local monopolies
Post-reform structure	Regulated competition, disintegration	Deregulation	Regulated competition	Deregulation	Deregulation, competition	Competition	Competition	Limited competition	Competition (partly)
Sweden vs. EU	Early	Early	Early	Early	Early/ syncronised	Early/ syncronised	Early	Early	Early
Public ownership of operator/s	Lower	Lower	Much lower	Much lower	Lower	Much lower	Much lower	Lower	High/higher (?)
Prices compared to index	Increased	Decreased?	Increased	Decreased?	Increased	Decreased	Decreased	Increased	Increased
Production	Increased	Increased	Decreased	Increased	Decreased	Increased	Increased	Decreased	Unchanged
Employment	Decreased	Decreased	Decreased	Increased	Decreased	Decreased	Increased	Decreased	Decreased
Productivity	Increased	Increased	Increased	Increased	Increased	Increased	Increased	Increased	?
Market concentration	Decreased	Decreased	Decreased	Decreased	Decreased	Decreased	Decreased	Decreased	Decreased?

Theoretical and normative lessons

In this section I will take a new look at the material, but this time with the aim of further developing the most important contributions of my thesis work, with a focus on the more generalised theoretical conclusions and implications to be made. Some of these are also closely linked to lessons of a more normative character (for regulators and procuring authorities), and will therefore also be presented.

The accidental factor and the dynamics of continuous change

As I have pointed out, the reforms in the Swedish rail and bus sectors retain some important characteristics of chance, in terms of how they accidentally and unintentionally set off a chain of events which ultimately led to a state of deregulation and market-opening that was by and large not foreseen at the beginning. Although I do find elements from new institutional theory and neo-institutional organisation theory to have relevance to these developments, I have shown that it is not sufficient to say that these regulatory reforms happened because such reforms were simply in vogue or "in the air" (see Foray, 1991, for a similar critique). As deregulation was not a foreseen implication (rail), or an expected choice (bus), one cannot even say that once these reform processes were initiated, they took the form of the institutionalised solution deregulation/privatisation. Later in the process, such influences did come to play a role, but the early local results also helped to produce the arguments behind such decisions. I have also shown that the view of institutional change as happening in the interplay between demanders and suppliers has to be complemented by the dynamic notion that reforms can actually change the relative power of stakeholders over time, and that this may even be a prerequisite for continuous change.

Another consideration to keep in mind is that the original intentions behind reforms will clearly affect how they are interpreted by different actors of the market. This will then influence behaviour and thereby probably also performance on several levels. When we have an accidental deregulation, it may not be obvious to all actors that the rules of the game have been changed in a way that might affect them profoundly unless they take certain actions. This could explain why it took at least two years (and several lost tenders) before SJ decided to consolidate the resources of its multiple firms operating in the bus sector, thereby creating Swebus. In contrast, Linjebuss was very quick to take advantage of the new situation. Intentions behind reforms also affect the way a reform is structured. If a government is aiming at more competition, it will usually try to consider how to best achieve this goal and possibly add certain stipulation to counter any negative effects. This was the

way reforms – clearly intended at deregulation and market-opening – were treated in Great Britain. In Sweden however, the framework had to be adapted again and again to take the ever-changing reality into account. The fact that Great Britain tried to consider everything at the outset, yet failed in some respects, is only proof that succeeding with regulatory changes will nevertheless always be extremely difficult due to their impact on many dynamic processes.

The irreversibility of reforms

The whole process of regulatory reform has often appeared to be by-and-large irreversible (or at least very hard to reverse), but there are some interesting occasions when reversibility has actually been applied and worked. Key prerequisites seem to be that a governmental or parliamentary decision has not yet been enacted or fully implemented. As Brunsson (1989) has noted, strong decisions can sometimes trigger opposite action. Rational arguments against the decision in question may come up and slow down the process of implementation. Also, sometimes a decision is consciously made in order to delay the demand for action.

Paths and bridges

In my analysis of the diffusion of competitive tendering, I have shown that the process bears some characteristics of path-dependency. In addition to this, I have also found instances where what I would call bridges or transitions have facilitated the process. One such bridge was to take the practice of tendering from the bus sector to the railway sector. Interestingly, this also directly inspired firms to make the move to enter the railway sector, having previously only operated in the bus sector. Thereby, it led to consequences not only regarding competition, but also regarding the transfer of other practices from the bus sector to the railway sector, which thus stimulated innovation. Exploring the concept of bridges could open up for an interesting field of further research, both regarding these and other sectors.

Step-by-step reforms and the advantages of going slowly

In retrospect there are very few steps in the Swedish railway reform process that can be viewed as radical. Instead, it has been a gradual process of incremental reforms over a long period in time. As has been mentioned, this is in stark contrast to, for example, the very quick privatisation process of just three years in Great Britain. Nevertheless, when we compare the situation in Sweden before and after the completion of the many small steps towards deregulation and market-opening, it is clear that the changes are fundamental and that the end result is not very different from that of Great Britain. There

is reason to believe that there are some advantages of going slowly with a deregulation, although this can also involve losing some first-mover advantages. For example, if one had wanted rail-related service providers to gain valuable experience under deregulated conditions prior to international expansion, then it might have been a wise move for Sweden to have fully deregulated domestic passenger-rail services even earlier.

Abnormal bidding behaviour and complex contracts

My work on abnormal or extreme bidding behaviour in tenders has served to develop the concepts and theoretical explanations behind the variety of company behaviours observed in tenders (not just bus or rail). Moreover, this work has produced much normative advice on how to detect and avoid these types of bids. One important conclusion is the importance of the open disclosure of bids and the full transparency of the bidding process. Problems with contracts resulting from abnormal bidding behaviour bear some similarity to the problems that may arise in even more complex and sometimes very long-term PPP contracts. As I have shown, the risk of incomplete contracts or asymmetrical conditions for exit between the partners necessitates insurances to avoid interruption of construction and services, and may also make it advisable to plan for renegotiations at some point during the contract period.

For the public procurer there is also additional advice to consider in order to keep the market competitive. Markets in which winning a competitive tendering is the primary means of entry or staying in business can be very fragile when it comes to upholding a dynamic competitive environment. Losing a key contract may lead to the permanent exit of a firm. As such circumstances will also make strategies like predatory bidding potentially more rewarding, it becomes even more important to monitor the bidding behaviour of firms. It may even be beneficial for procuring authorities that are keen on keeping competition healthy in the long run to take special precautions to avoid the unnecessary exit of certain firms. One way could be to coordinate the timing of different tenders in adjacent regions so that firms get more chances to stay around if they lose one important contract.

The importance of economies of scale and scope vs. competition

Scale and scope economies can be inherent in a system, but the regulatory framework or other conditions may make the incentives to exploit them weak or non-existent. Once this is changed, they can have a great impact on industrial transformation, but still, firms must be willing to exploit these economies. The fact that this did not really happen before competition took off in the Swedish rail and bus industries makes for an interesting

observation: inter-modal competition was apparently not enough. This thesis has clearly focussed its interest upon the introduction of more intra-modal competition in the bus and rail sectors, respectively, e.g. how bus companies have come to compete with other bus companies. It has often been argued that for public modes of transportation such as bus and rail services, the most important issue regarding competition should be how to deal with inter-modal competition, primarily the threat posed by private automobiles. Proponents of this view have typically viewed the introduction of intra-modal competition between bus and rail operators as a secondary issue at best, and as a destructive one at worst.

In my view, this is a too narrow way of looking at these reforms, at least in retrospect. In a historical context, the removal of intra-modal competition was typically implemented as a reaction to inter-modal competition (from the car) becoming too strong to handle. The monopolies this created made it possible for these modes of transport to survive, which most people would consider a good thing. However, over time this model became (through rising subsidies) increasingly costly, and it may also be argued that the model limited the real incentives to improve the actual competitiveness of the public transport modes. In the end, the re-introduction of intra-modal competition was probably necessary in order to revitalise these modes and bring back a joint focus on effectiveness, efficiency and customer orientation. In other words, competition from other modes has certainly been an important and necessary form of competition, but it has not been sufficient to push the limits of what the bus and rail sector can offer.

The role of individual firms and choices

There is also a message on methodology to be conveyed. By taking the realist approach, having faith in detailed empirical analysis (without limiting myself too much by means of a pre-understanding of the objects of study), as well as allowing myself to try many different approaches and angles, it has been possible for me to discover things I would otherwise have missed. For example, I maintain that to simply deregulate and introduce competition is not enough. There have to be actual firms and entrepreneurs ready to take the plunge and test the boundaries. These firms do not magically appear, and most importantly, they might not necessarily be replaced by others or be able to return if they have to leave the market (not to mention the consequences this might have on individual employees). There is also a need to consider the importance of events that function as sparks and generate news, which have an impact out of the ordinary. Finally, the choices made by individual firms and organisations must not be neglected.

Postscript: The future of deregulation

After 30 years of regulatory reforms in the Swedish bus and railway sectors, we can conclude that these sectors – as with most other industries – appear to be moving towards a system more like that of a traditional open market, and that the long separation of transport into several sub-markets with different regulatory frameworks might be coming to an end. The current center-right-liberal government has again (as it did in 1994) pushed for (and succeeded to getting) a parliamentary decision to open up domestic passenger-rail operations to direct on-the-track competition, thereby breaking up the final remnants of the old monopoly. One of the arguments made is that this is the only way to give the end-consumers, by means of their choices, some real influence on market development.

However, a couple of specific problems still remain, and may therefore affect how much real competition the proposed changes will actually lead to. For example, given the capacity constraints of the Swedish rail infrastructure, a model is needed that can serve to distribute capacity in an efficient and non-discriminatory way between competing firms. So far, such a model has not been fully developed (or at least not officially presented), although there have been discussions on granting capacity on the grounds of socio-economic efficiency and/or instituting auctions in which the highest bidder takes precedence. Either way, no operator would be guaranteed a certain position in the time-table for more than one year at the time, which would limit the possibility for new operators to make long-term commitments.

In the bus sector, the government has taken a slightly more cautious approach. In 2009 a radical proposal was made (in a report commissioned by the government) to dismantle the County Public Transport Authorities and remove all obstacles to new entry in local and regional public transport operations, by-and-large creating a fully deregulated market similar to the one in Great Britain (outside London). In 2010 the government instead proposed to allow operators to start commercial services in addition to those already provided by regional authorities, but not to break up the entire system of coordinated public transport services. Although such a cautious move can be justified both by political concerns as well as by the evidence provided by more far-reaching reforms in other countries, it does not solve the more general problem of defining the borderline between commercial and subsidised traffic. A commercial service might for example have very limited protection from new public transport services based upon subsidies.

These recently proposed regulatory reforms (yet to be fully implemented) seem to address the lack of truly commercial initiatives in a market where path-dependency might have created something close to a lock-in to the institution of competitive tendering. However, as these reforms will primarily

have an impact on the profitable segments of the market, where competitive tendering is less important, they may not to be viewed as disruptive steps away from the previous path, despite being relatively radical and controversial.

Given the current political climate, it is possible that a new left-wing/green government may (as it did in 1994) choose to reverse the decision to deregulate domestic passenger trains. It remains to be seen if, this time around, the industry will back the 2010 decision if challenged by a shift in political power. If the new reforms are implemented this fall, the possibilities to reverse them are likely slim, as this would require a much greater effort and probably be very costly.

On a more general level, one can observe that although the on-going financial crisis has generated a renewed interest state intervention and more tightly controlled financial markets, this shift has not yet really affected other sectors. The international movement towards deregulation of transport is still strong, with new initiatives expected to emerge, for example from the European Commission regarding domestic passenger trains. The early experiences of Sweden will most probably continue to play a role in the shaping of such initiatives.

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Appendices

Appendix 1: Interviews 1994-2009[18]

Thomas Adelöf, Jönköpings Länstrafik, 1997-10-27, 1999-04-27 and several interviews by phone

Tomas Ahlberg, SJ, 2007-09-27

B. Andersson, Hallandstrafiken, 1996-08-22 (phone)

E. Andersson, Jönköpings Länstrafik, 1996-08-15 (phone)

Kjell Åke Andersson, Volvo, 1999 (phone)

Sonja Andersson, Västernorrlands läns trafik, 1999-06-09

Tom Andersson, Svenska LokalTrafikFöreningen, 1995-02-24

Magnus Andersson, SJ Affärsområde Länstågen, 1997-10-29

Rolf Apelqvist, Swebus, 1998 (phone)

Anders Arnell, Jernhusen, 2004-11-21

Lennart Arnrup, Östgötatrafiken, 1995-04-03 (phone) and 1996-05-23

Björn Asplund, Transitio, 2007-10-29

Jan-Erik Astonius, Shortline Väst, 1999-12-01

Sten Axeheim, previously SJ Affärsområde Pågatågen, 2000-02-10

Johan Bager, SJ Gods, 1998

Claus Bay, Svenska Neoplan, 1998 (phone)

Christer Beijbom, SJ Cargo Group, 2000-02-15 and other occasions

Göran Bender, Länstrafiken Örebro, 1995-02-08 (phone), 1996-05-29 and 1996-08-27 (letter)

Per Bengtsson, BK Tåg, 1999-03-05 (phone)

Jan-Olov Bergkvist, BSM, 1998-06-25

G. Blad, Länstrafiken Kristianstad, 1996-08-27 (phone)

Håkan Boberg, Regeringskansliet, December 1999 (phone)

Jan Brandborn, Vägverket, previously Banverket, 2000-02-17

[18] The stated organisation after each name indicates where the person was working at the time of the interview.

S. Broman, Uppsalabuss, 1996-08-13 (phone)

Charles Brown, Office of the Rail Regulator, London, 1997-04-15

Tomas Byberg, Byberg & Nordins Busstrafik, 1998 (phone)

Ivan Bäckström, Länstrafiken i Västerbotten, 1995-02-08 (phone)

Kenny Carlsson, Konkurrensverket, 1997-10-24

M. Casemyr, Storstockholms Lokaltrafik, 1996-08-22 (fax)

H. Cidell, Katrineholms kommun, 1996-08-29 (phone)

Philip Cox, Department of Transport, London, 1997-04-16

Lennart Dahlborg, Statens Järnvägar, 2007-11-14

S. Dahlskog, Östgötatrafiken, 1996-08-15 (phone)

Hans Danielsson, Swebus, 1999-06-09

Lennart Danielsson, SJ Stab, 1997-10-29

L. Drugge, Länstrafiken i Norrbotten, 1996-08-22 (phone) and 1996-08-29 (fax)

H. Eberfors, Eskilstuna kommun, 1996-08-27 (phone)

L.-Å. Edesgård, Karlstad kommun, 1996-06-04 and 1996-08-22 (phone)

A. Edholm, Östersund kommun, 1996-08-15 (phone)

Å. Edvardsson, Sandvikens kommun, 1996-08-23 (phone)

Claes Elgemyhr, Järnvägsstyrelsen, 2004-10-28 (phone)

B. Enbuske, Haparanda kommun, 1996-08-22 (phone)

Hasse Ericsson, Värmlandstrafik, 1995-02-13 (phone), 1996-06-04 and 1996-08-16 (phone)

Rolf Ericsson, Svenska Buss, 1998 (phone)

Eva och Lars Eriksson, Ceris Resor, 1999 (phone)

Hans Eriksson, previously Västmanlands Lokaltrafik, 2000-09-15 (phone)

T. Eriksson, Länstrafiken i Västerbotten, 1996-08-21 (phone)

Dag Fagring, Bussbranschens Riksförbund, 1998-10-16

Mikael Falkendal, Skövde-Karlsborgs Järnväg, 1999-05-06

Björn Floresjö, Dalatrafik, 1995-02-21 (phone), 1996-06-24, 1998-08-06 and 2000-09-05 (phone)

Bo Fredriksson, Storstockholms Lokaltrafik internrevision, December 1999 and several phone interviews

A. Förberg, Blekinge Länstrafik, 1996-08-15 (fax)

L. Granath, Nyköpings kommun, 1996-08-27 (phone)

Krister Gunnarsson, BK Tåg (Österlenaren), 1997 (phone)

Lars-Göran Hansson, Konkurrensverket, 1997-10-24

Nils Harvard, Länstrafiken Jämtland, 1995-02-15 (phone)

Harry Hedberg, Mälarvik Buss, 1999 (phone)

Lars Hellsvik, Näringsdepartementet, 2009-05-14

E. Hjortsberg, Hallstahammars kommun, 1996-08-21 (phone)

Tord Hult, BK Tåg / Citypendeln, 1997-10-28, 1999-05-17, 2000-08-09 and 2000-10-03 (phone)

Torsten Hydén, Jernhusen, 2004-11-26

Karl Axel Håkansson, previously SJ Affärsområde SL Pendeltåg, 2000-01-24

L. Häägbo, Övertorneå kommun, 1996-08-28 (phone)

B. Högklint, Kalmar Läns Trafik, 1996-08-15 (phone)

R. Ingberg, Oxelösunds kommun, 1996-08-27 (phone)

Håkan Jacobsson, Rikstrafiken, 2000-11-08 (phone)

Kaj Janérus, Delegationen för köp av viss kollektivtrafik, 1998-10-20

Daniel Jansson, Kalmar Läns Trafik, 1994-11-07

Eva Johannesson, Banverket Region Syd, 1997 (phone)

Stephan Johannesson, Skånetrafiken, 2000-09-22 (phone)

Bengt-Erik Johansson, Länstrafiken i Norrbotten, 1995-03-09 (phone)

Bengt-Erik Johansson, Tågkompaniet, 2007-03-28

Jan Johansson, Tågkompaniet, 2000-03-14 and 2004-03-19 (phone) and several additional interviews by phone

Tord Johansson, Lapplandspilen, 1998 (phone)

Per Arne Jonsson, Kollektivtrafiken Gotlands kommun, 1995-02-10 (phone), 1996-07-01 and 1996-08-23 (phone)

Sture Jonsson, Upplands Lokaltrafik, 1995-02-10 (phone) and 1995-04-12 (phone)

A.-S. Jönsson, Umeå Lokaltrafik, 1996-08-19 (phone)

Ronnie Kalén, Stadstrafiken Lund, 1996-08-28

Johnny Karlsson, Storstockholms Lokaltrafik, 1999-10-20

P. Karlsson, Värnamo kommun, 1996-08-23 (phone)

Anders Klasson, Stora, 1999 (phone)

Henrik Kolga, Linjebuss, 1998 (phone)

Hans Kolm, Länstrafiken i Malmöhus Län, 1994-12-19

L.-Å. Larsson, Gävle kommun, 1996-08-19 (fax)

Stig Larsson, previously SJ, 2005-04-26

Jarl Arne Leek, Hallandstrafiken, 1995-02-07 (phone) and 1995-02-22 (phone)

Helena Leufstadius, Göteborgs och Bohus Läns Trafik, 1996-09-02 (fax)

Mårten Levin, Storstockholms Lokaltrafik, 2007-11-12

Per Lindblad, Blekinge Länstrafik, 1995-02-15 (phone)

C. Lindgren, Upplands Lokaltrafik, 1996-08-16 (phone)

N. Lindgren, Helsingborgs kommun, 1996-08-26

Sven Lindström, SJ Gods, 1998-10-23

H. Ljungkvist, Länstrafiken Sörmland, 1996-09-03 (phone)

Anders Lundberg, SJ Stab Strategisk Utveckling, 1998-10-13

G. Lundblad, Länstrafiken i Malmöhus län, 1996-08-30 (phone)

Göran Lundgren, Arlanda Express, 1998-11-06

B. Lundin, Västernorrlands läns Trafik, 1996-08-22 (fax)

Ingemar Lundin, SJ, 2007-09-27

Ulf Lundin, Rikstrafiken/Utredningen om en ny kollektivtrafiklag, 2009-05-11

Jan-Erik Lång, Helsingborgs kommun, 1996-08-26 and 1999-06-09

S. Magnusson, EGE-Trafiken, 1996-08-28 (phone)

Johan Masgård, BSM Järnväg, 1998-04-02, 1999-11-17, 1998-06-08 (phone) and 2000-11-10 (phone)

Ulla Mohlin, Mohlins Bussar, 1999 (phone)

Thomas Montgomery, X-Trafik, 1995-02-09 (phone), 1996-07-18 and 1996-08-23 (phone)

Bengt Möller, EuroMaint, 2008-06-30 (phone)

J. Möller, Länstrafiken i Malmöhus län, 1996-08-29 (phone)

Tommy Nilson, BK Tåg/Sydvästen/Citypendeln, 2000-03-22 and 2000-05-26 (phone)

B. Nilsson, Västerviks kommun, 1996-08-19 (phone)

I. Nilsson, Stenungsunds kommun, 1996-09-03 (phone)

L. Nilsson, Kristinehamns kommun, 1996-08-28 (phone)

Ragnar Norbäck, Linjebuss Sverige, 1994-10-31

Olof Nordell, Svenska LokalTrafikFöreningen, 1994-05-02

Mikael Norlander, Jernhusen, 2004-11-21

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Ragnar Nordström, Linjebuss, 1999-11-22

A. Nykvist, Lomma kommun, 1996-08-22 (phone)

Claes Olofson, Buss i Väst, 1994-12-20 and 1999-05-06

I. Olsson, Luleå Lokaltrafik, 1996-08-19 (phone)

Inger Olofsson, Tapanis Buss, 1998 (phone)

M. Olofsson, Göteborgsregionens Lokaltrafik, 1996-09-02 (fax)

Fredrik Oskarsson, Nordwaggon, 1999 (phone)

Lasse Persson, Linjebuss, 1998 (phone)

Magnus Persson, Mälardalstrafik AB, 1999-10-21

Jan Peter Petersson, Jönköpings Länstrafik, 1995-02-24 (phone)

Ulf Petersson, Länstrafiken Kronoberg, 1995-02-15 (phone), 1996-05-28 and 1996-08-16 (phone)

Bo Pettersson, Säfffleb ussen, 1999-05-07

Mikael Prenler, Delegationen för köp av viss kollektivtrafik, 1998-06-25, and Tåg i Bergslagen, 2000-05-25 (phone) and 2000-08-28 (phone)

John Preston, Institute for Transport Studies, University of Leeds, 1997-04-11 and several other occasions

Ewa Rosén, Länstrafiken Kristianstad, 1995-04-10 (phone)

L. Rudström, Älvsborgstrafiken, 1996-08-23 (phone)

Jonas Rydberg, Linjebuss, 1999-06-11

U. Sahlström, Hofors kommun, 1996-09-03 (phone)

J. O. Seveborg, Karlstad kommun, 1996-06-04

Kjell Sevefjord, Seko, 2000-01-21

Margaretha Silverstrand, Silverstrands Trafik, 1999 (phone)

Roger Sjöberg, Scandrail, 1999-11-17

Einar Smitterberg, Swebus, 1994-12-02

Bob Stannard, Office of Passenger Rail Franchising, London, 1997-04-14

Hans Stenbacka, Banverket, 2004-10-29 (phone)

Michael Stjernberg, Göteborgsregionens Lokaltrafik, 1994-12-20

E. Strand, Strängnäs kommun, 1996-08-28 (phone)

Lars Strid, Älvsborgstrafiken, 1995-02-14 (phone)

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Björn Sundén, EuroMaint, 2004-11-25 and 2004-12-01

Örjan Svensson, Svenssons Bussar i Gnarp, 1998 (phone)

C. Tarberg, Sundsvalls Trafik, 1996-08-28 (phone)

Åke Thunell, Thunells Bussar, 1999 (phone)

Rolf Torwald, Sydvästen, 2000-03-20 and 2000-05-31 (phone)

E. Tufvesson, Dalatrafik, 1996-08-14 (fax)

Sven Tufvesson, Länstrafiken Kristianstad, Autumn 1997

Ulf Tunberg, Regionplane- och trafikkontoret, Stockholms Läns Landsting, December 1999 and numerous additional phone interviews

Claes Ulveryd, Skånetrafiken, 2000-02-10 and several phone interviews

Attila Ungvari, Göteborgs och Bohus Läns Trafik, 1996-08-21 and 1996-09-02 (phone)

Jan Wallenkurtz, previously Sydtåg, Autumn 1997

Anders Wermelin-Börjesson, Adtranz, 1998

Pether Wallin, EuroMaint, 2004-11-25 and 2004-12-01

L. Wessling, Swebus Härnösand, 1996-08-28 (phone)

T. Westman, Örnsköldsviksbuss, 1996-08-29 (phone)

Gerard Whelan, Institute for Transport Studies, University of Leeds, 1997-04-11

P. Wiberg, Västmanlands Lokaltrafik, 1996-08-14 (phone)

Staffan Widlert, Rikstrafiken, 2005-12-07 and 2007-05-10

Thomas Wieslander, Skaraborgs Läns Trafik, 1995-03-08 (phone), 1996-06-27 and 1996-08-29 (phone)

K. Wretstrand, Swebus Helsingborg, 1996-08-26

Sven Wärnfeldt, Dalatrafik, 1998-08-06 and 2000-02-17

P.-O. Wästberg, Borgholms kommun, 1996-08-29 (phone)

Lars Yngström, Tågåkeriet i Bergslagen, 1998

Kjell Åbrink, Storstockholms Lokaltrafik, 1994-12-12 and 1995-04-10 (phone), and Linjebuss, 1998-10-22, and several other occasions

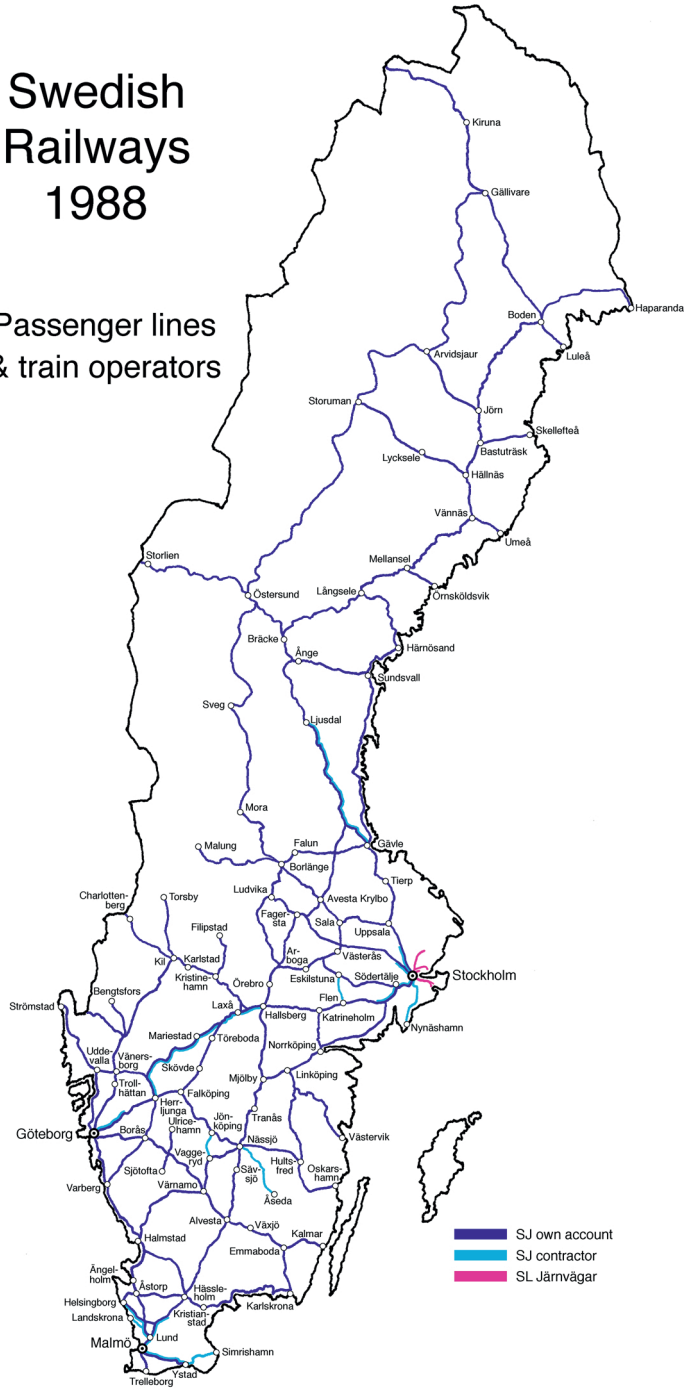
B. Ödlund, Stadstrafiken Göteborg, 1996-08-16 (fax)

Appendix 2: Passenger lines and train operators in Sweden 1988-2007

- Passenger lines and train operators 1988
- Passenger lines and train operators 1990
- Passenger lines and train operators 1992
- Passenger lines and train operators 1994
- Passenger lines and train operators 1996
- Passenger lines and train operators 1998
- Passenger lines and train operators 2000
- Passenger lines and train operators 2007

Swedish Railways 1988

Passenger lines & train operators

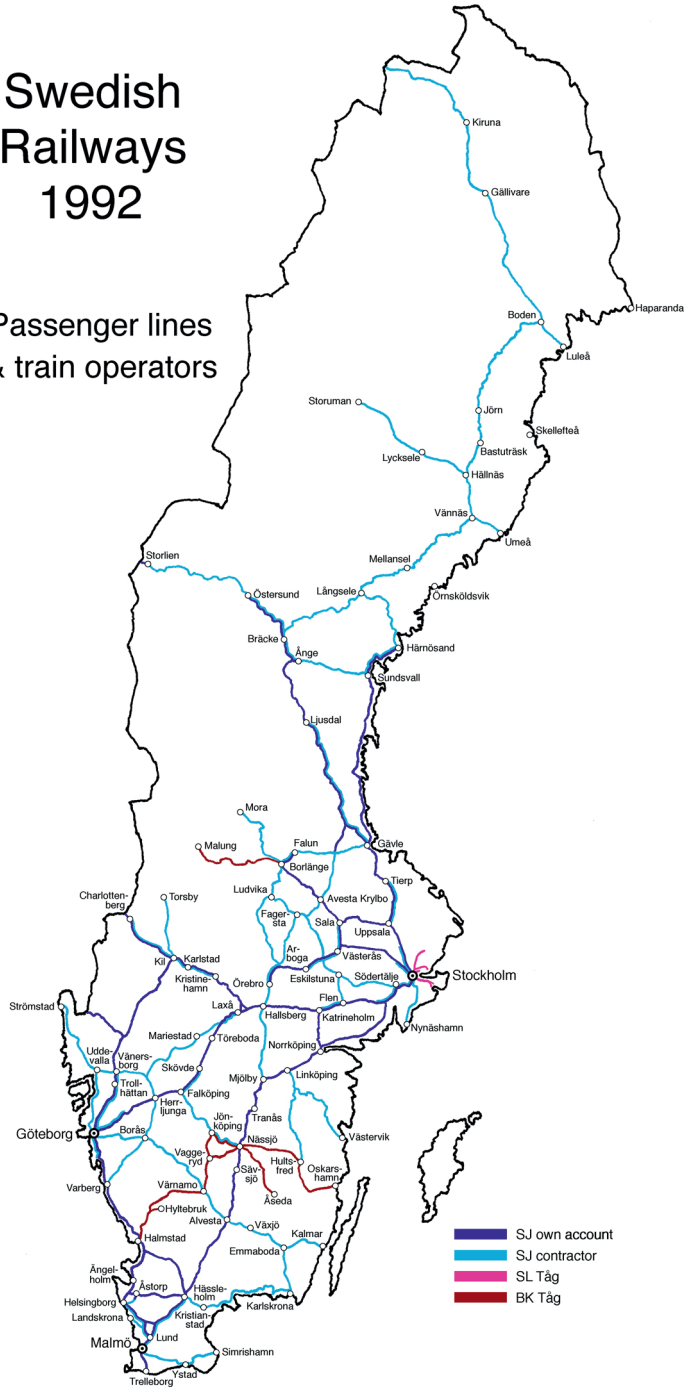


Swedish Railways 1990

Passenger lines & train operators

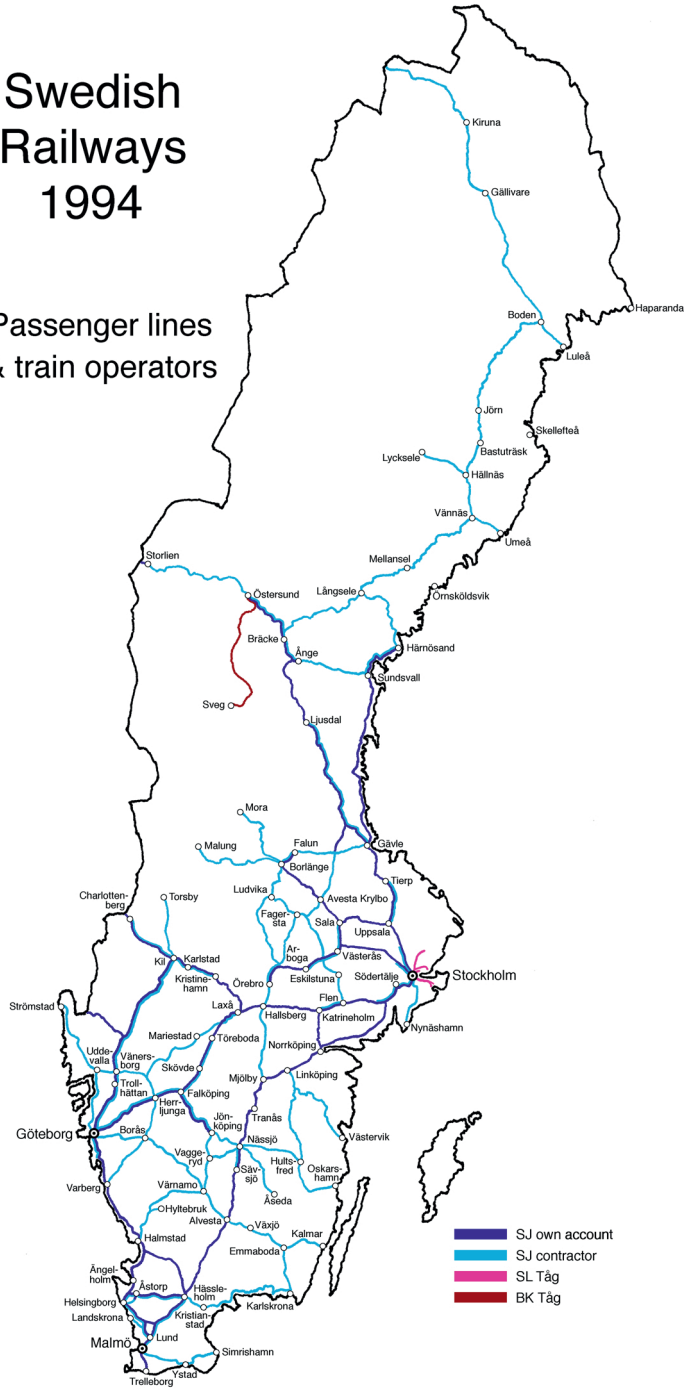
Swedish Railways 1992

Passenger lines & train operators



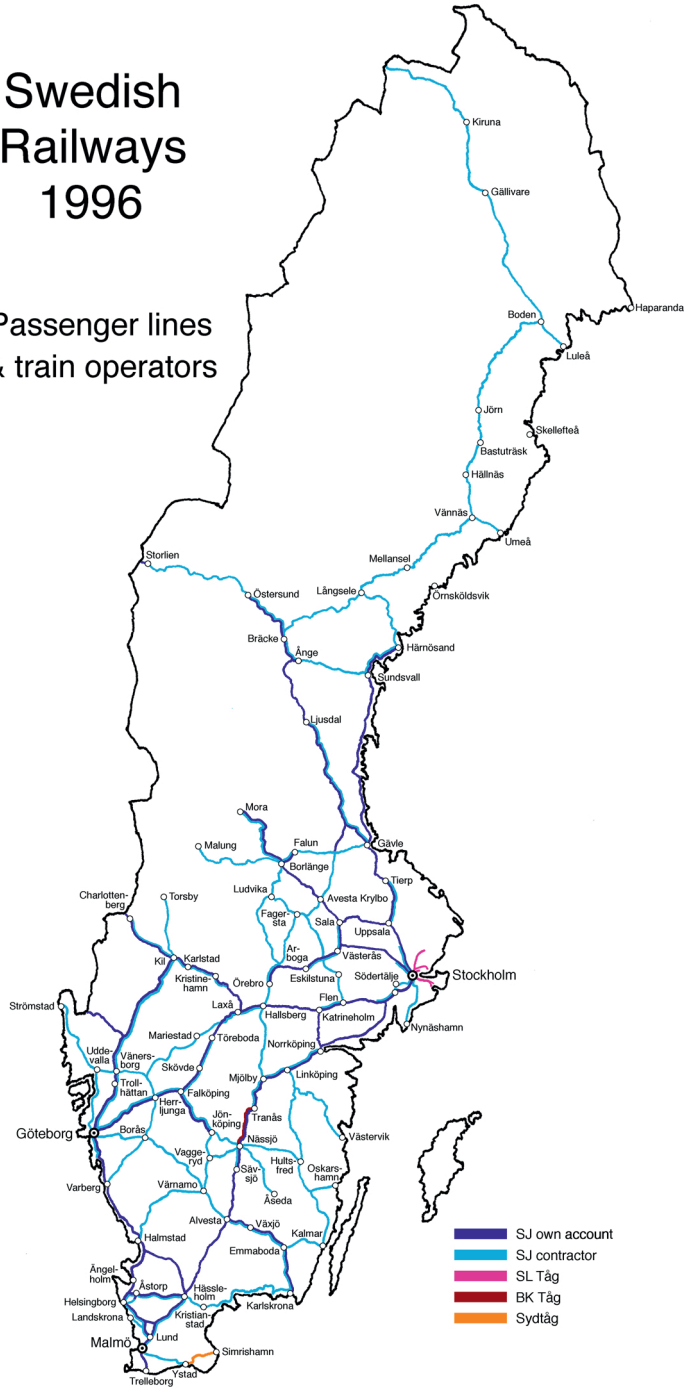
Swedish Railways 1994

Passenger lines & train operators



Swedish Railways 1996

Passenger lines & train operators



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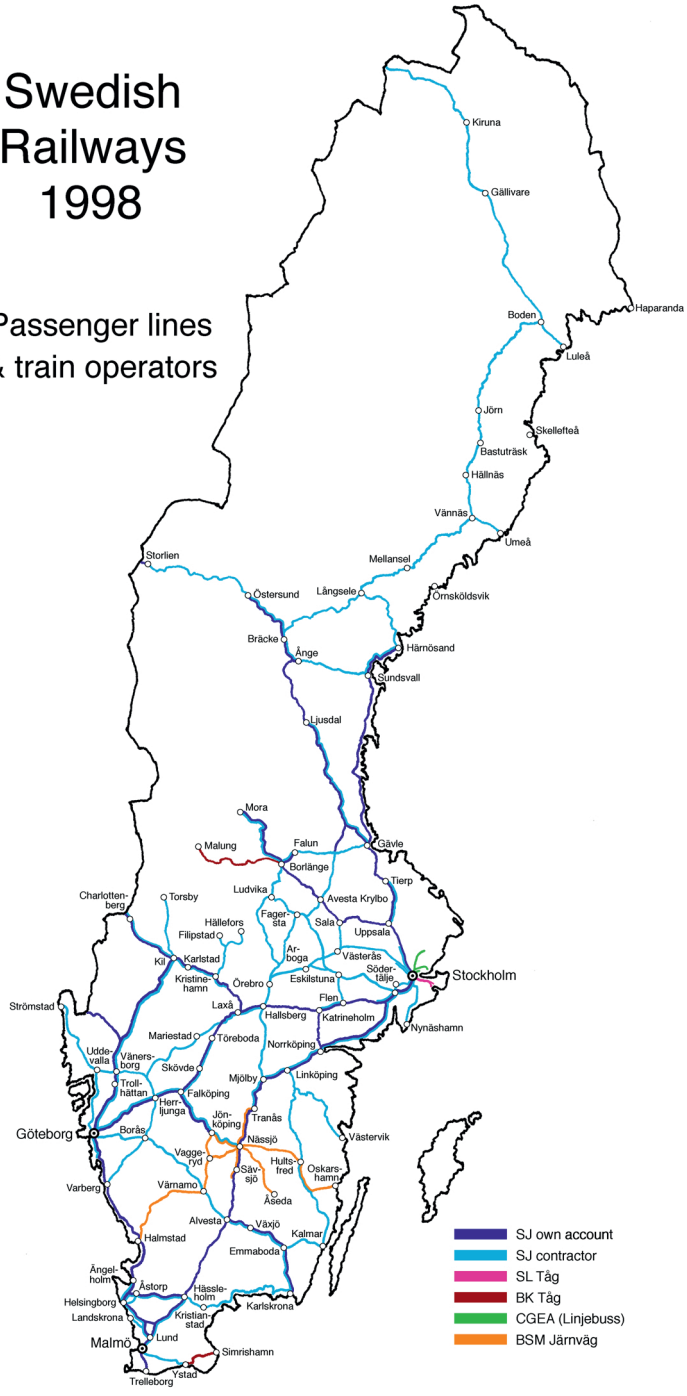
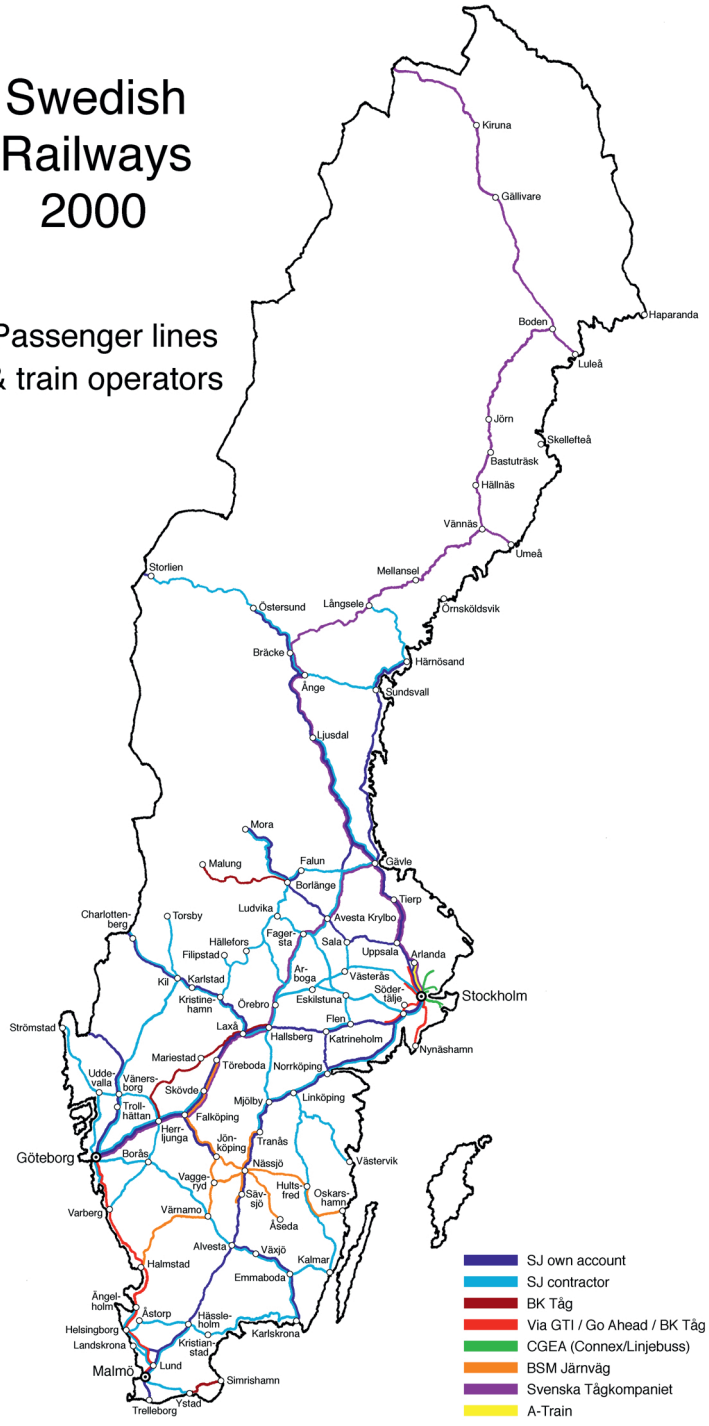
Passenger lines & train operators



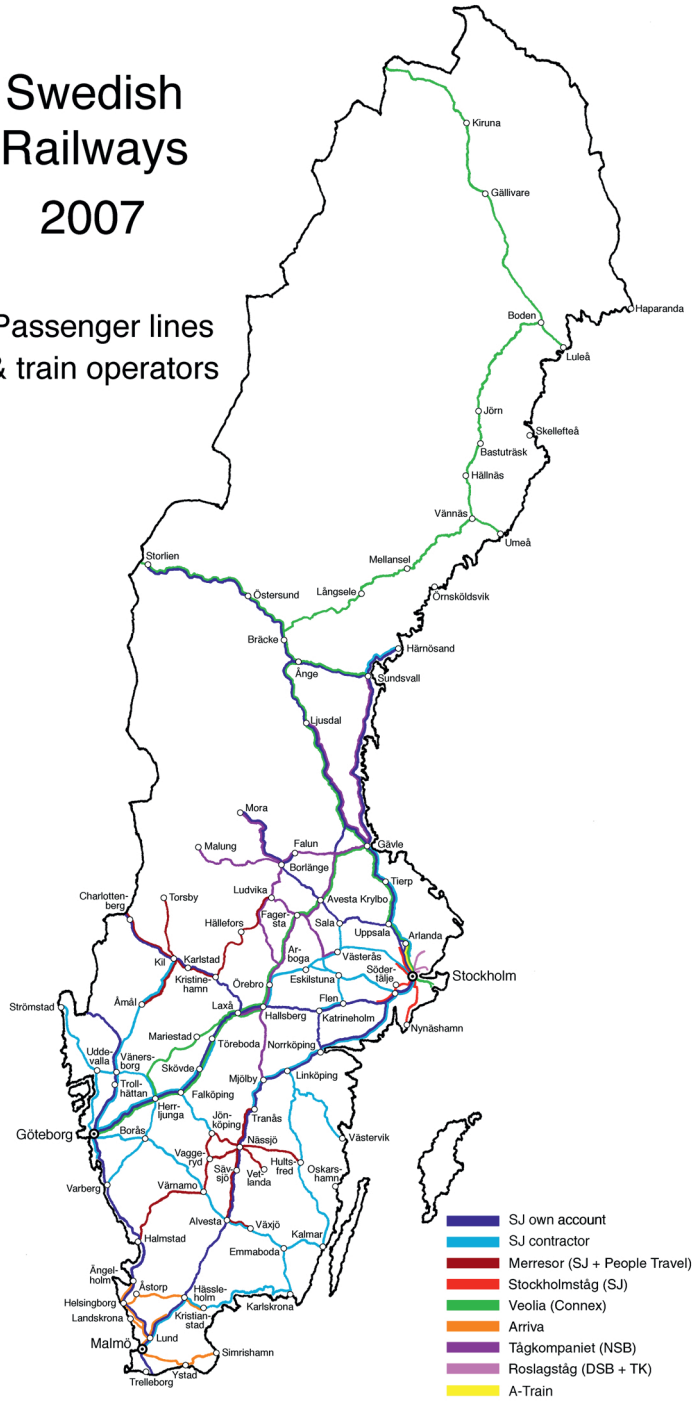
Swedish Railways 2000

Passenger lines & train operators



Swedish Railways 2007

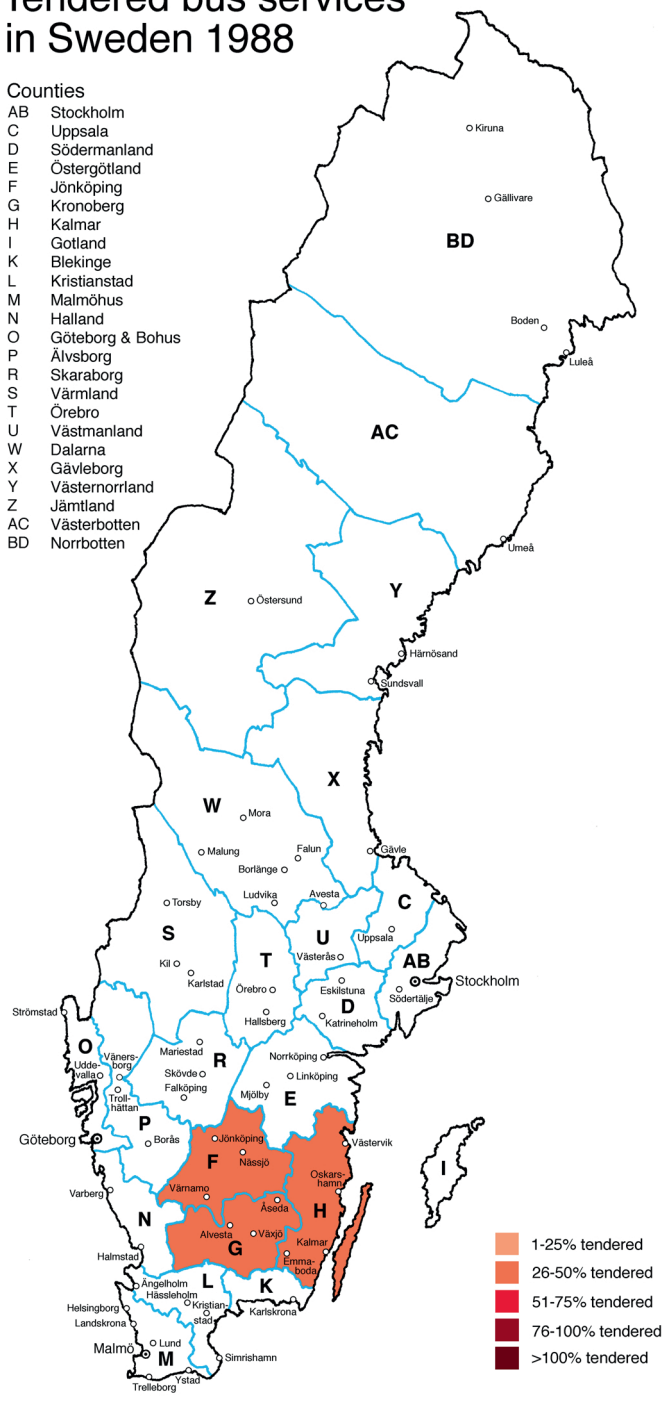
Passenger lines & train operators



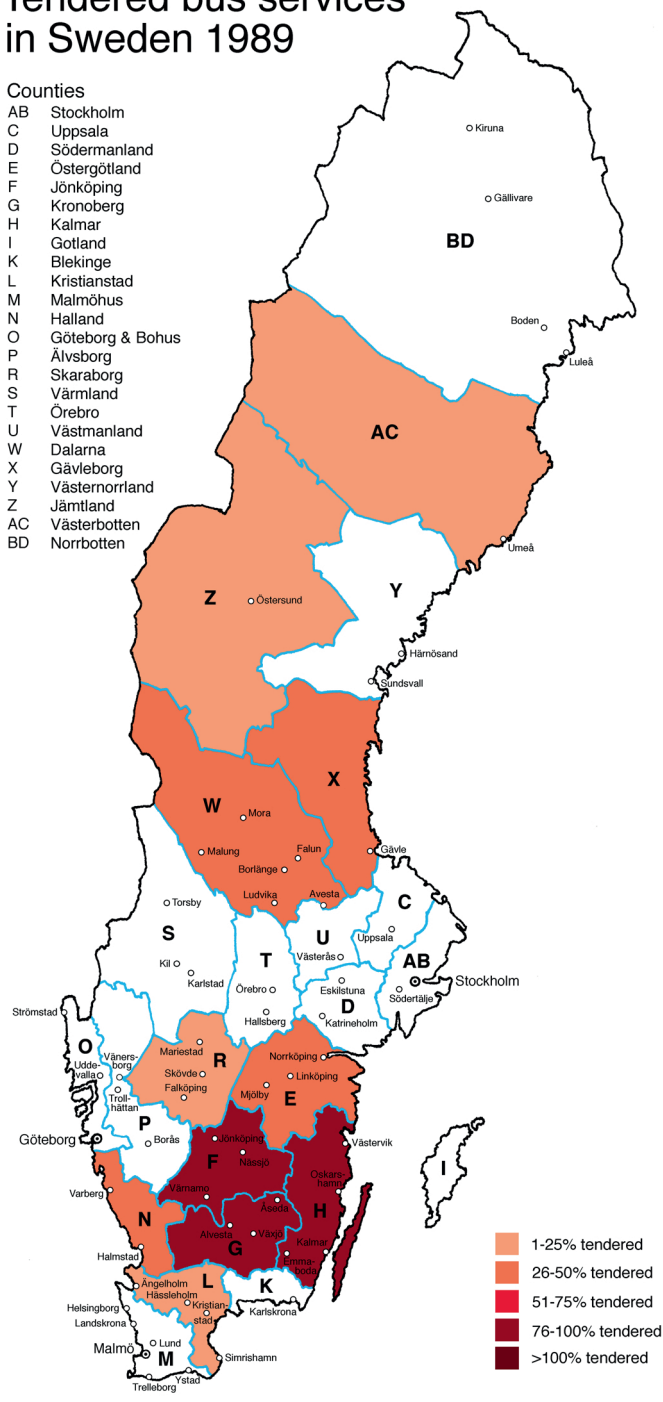
Appendix 3. The spread of tendering of bus services in Sweden 1988-2000

- Tendered bus services in Sweden 1988
- Tendered bus services in Sweden 1989
- Tendered bus services in Sweden 1990
- Tendered bus services in Sweden 1992
- Tendered bus services in Sweden 1994
- Tendered bus services in Sweden 1996
- Tendered bus services in Sweden 1998
- Tendered bus services in Sweden 2000

Tendered bus services in Sweden 1988



Tendered bus services in Sweden 1989



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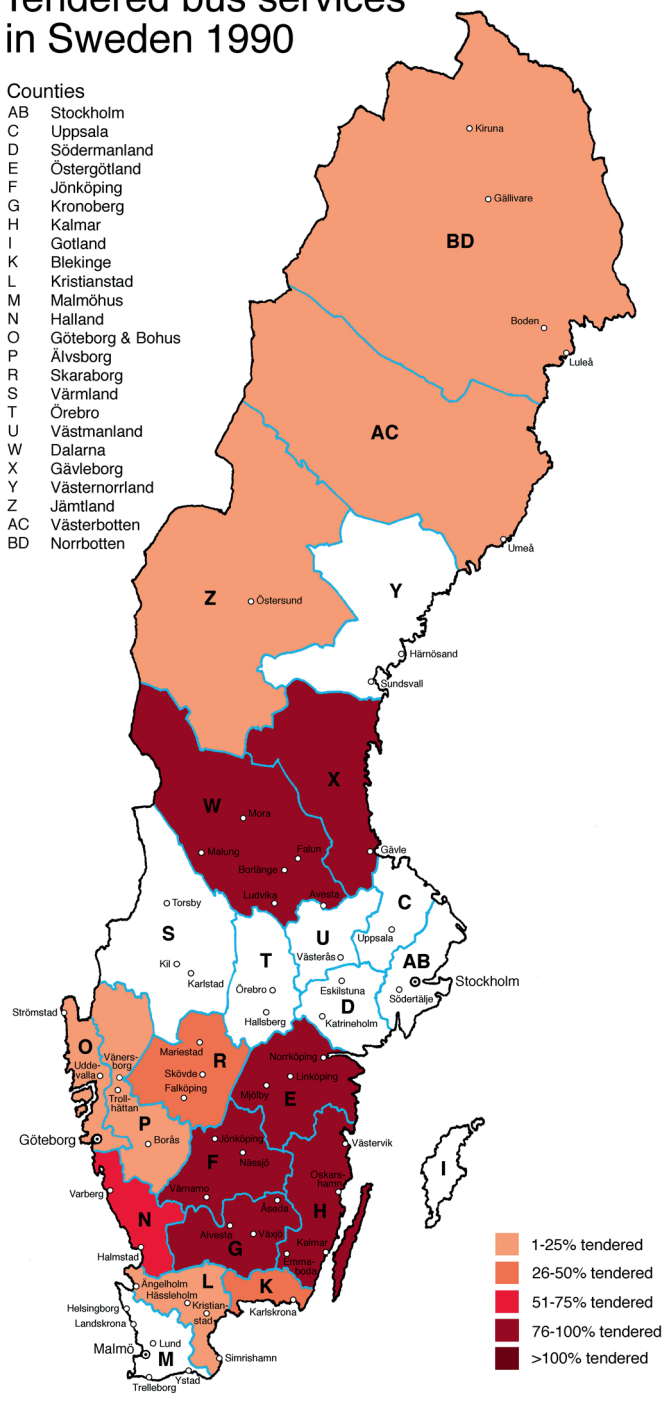

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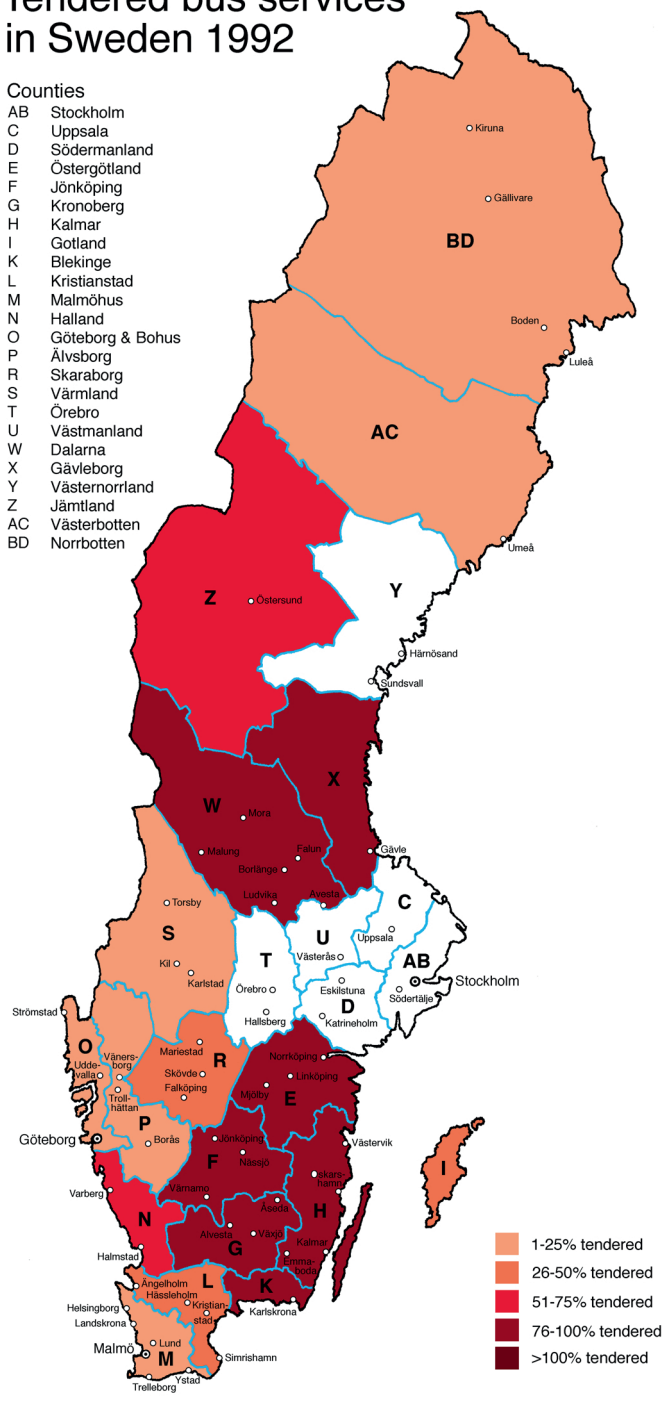

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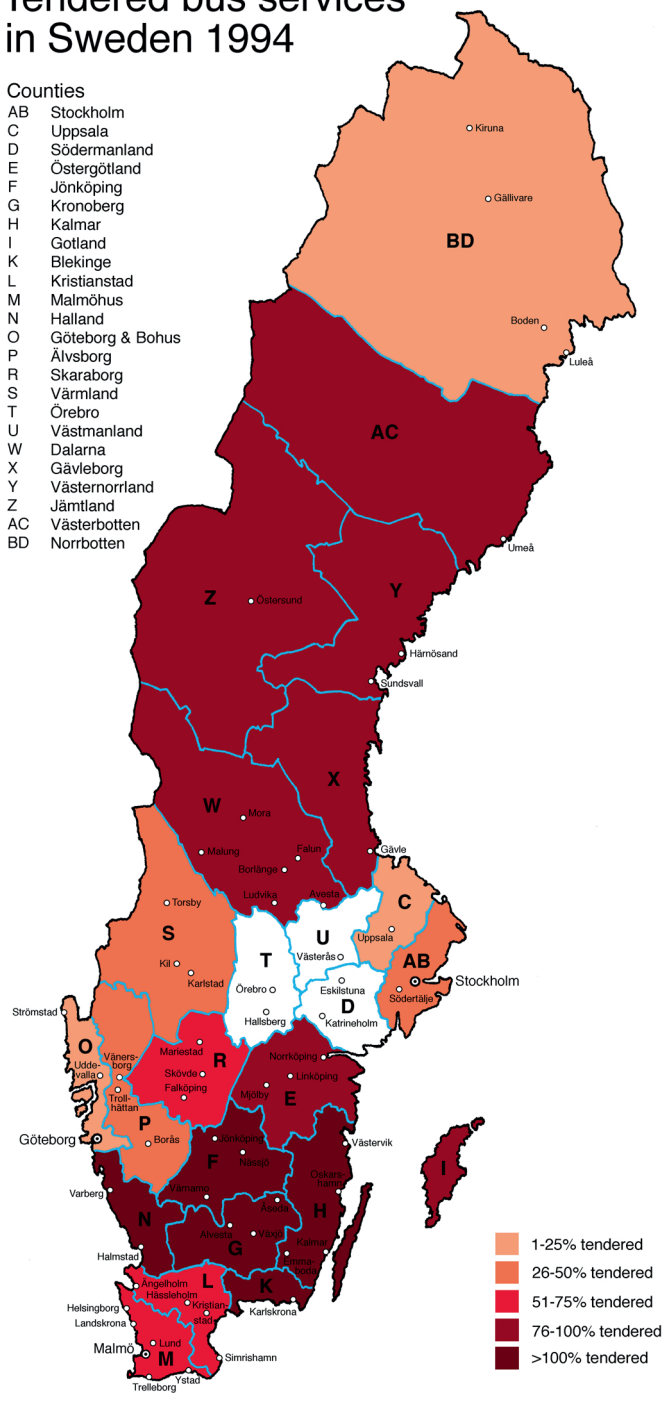
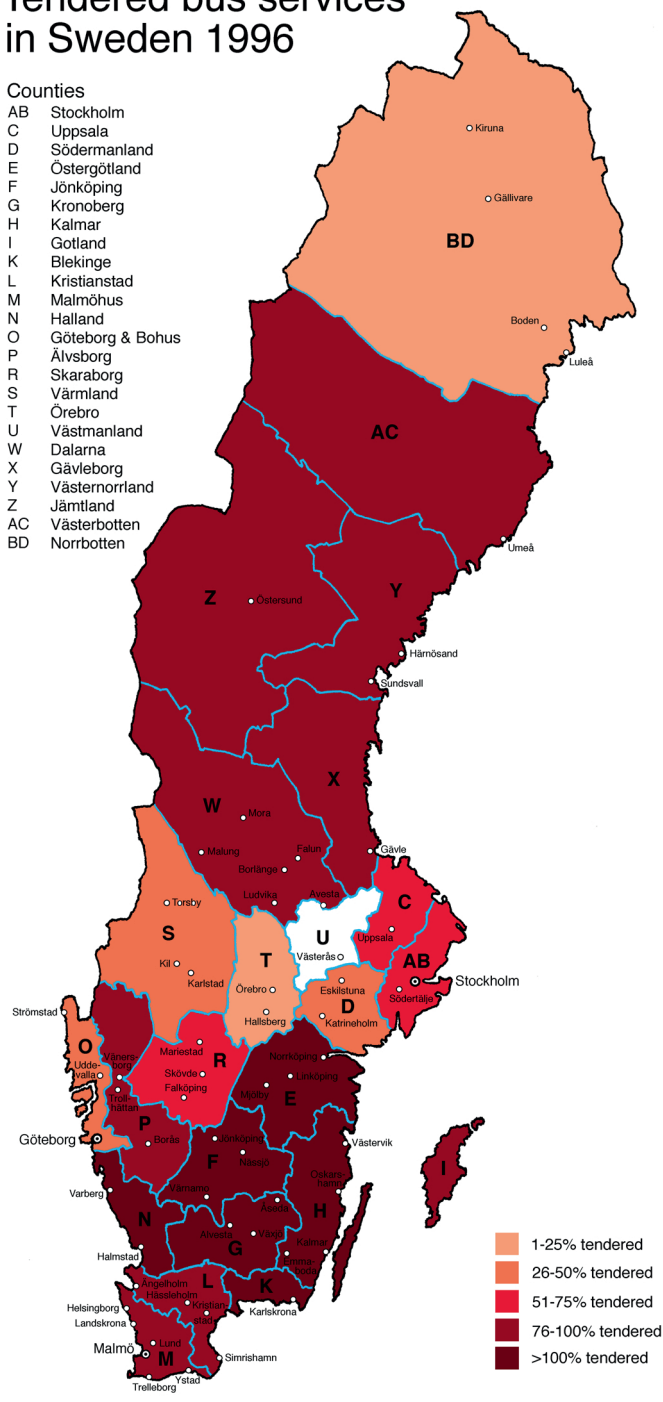
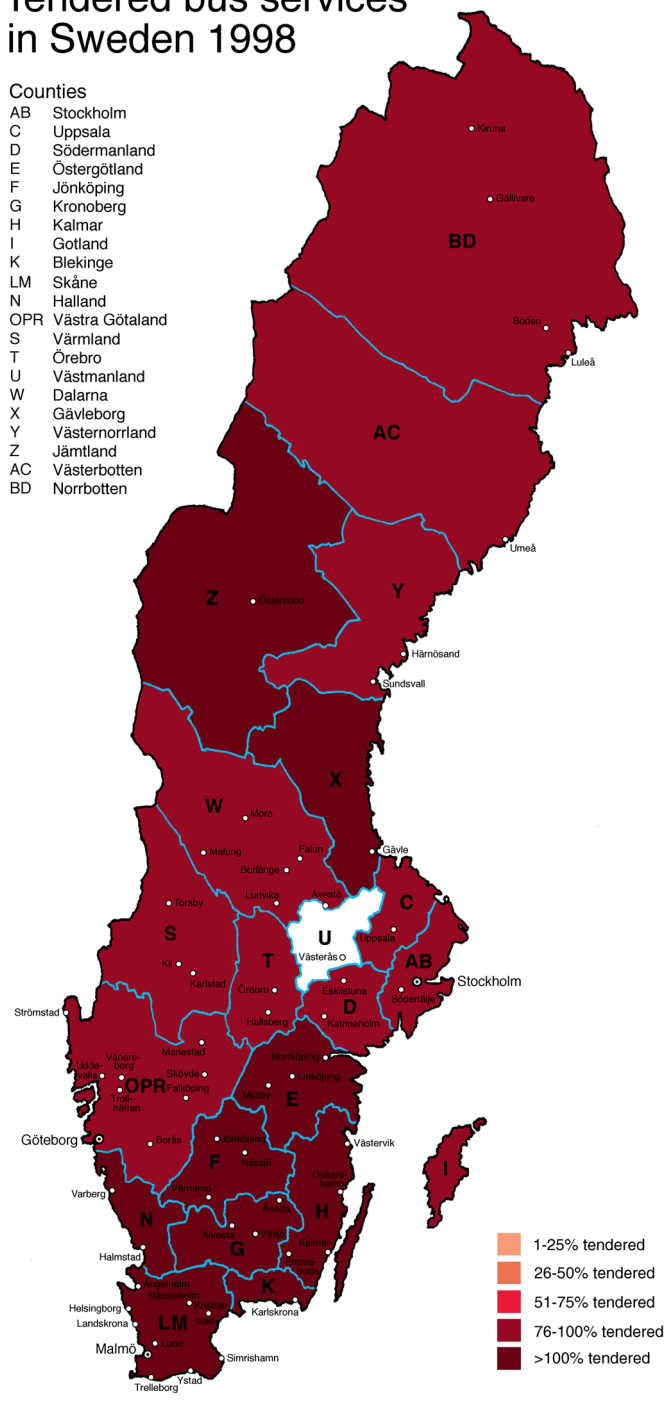


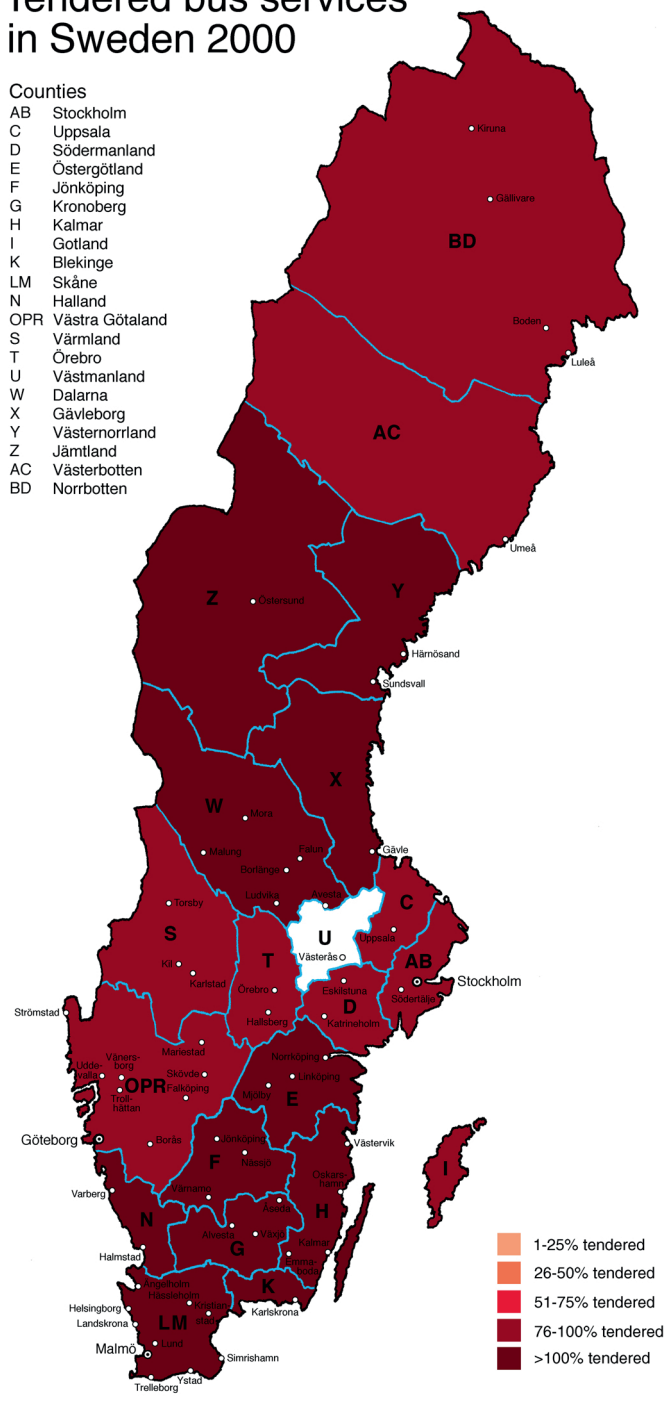
Tendered bus services in Sweden 1996



Tendered bus services in Sweden 1998



Tendered bus services in Sweden 2000



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