Reforming a publicly owned monopoly
To my family
Reforming a publicly owned monopoly
Costs and incentives in railway maintenance
Abstract


The railway system is often considered to be an industry where a monopoly occurs “naturally”, which can explain the public ownership and the use of regulations. However, railways in Europe have been subject to reforms during the last three decades. The use of tendering has increased, which is a way of introducing competition for the market in absence of competition within the market. Still, contracting out services previously produced in-house places a heavy burden on the client, where contract design and its incentive structures can be decisive for the outcome of the reform.

This dissertation provides empirical evidence on costs and incentives in a publicly owned monopoly that is subject to reforms, namely the provision of railway maintenance in Sweden.

Essay 1 estimates the effect of exposing rail infrastructure maintenance to competitive tendering. The results show that this reform reduced maintenance costs in Sweden by around 11 per cent over the period 1999-2011, without any associated fall in the available measures of quality.

Essay 2 estimates the relative cost efficiency between and within maintenance regions in Sweden. The results indicate considerable efficiency gaps together with economies of scale not being fully exploited.

Essay 3 analyses the effect of incentive structures in railway maintenance contracts. An increase in the power of the incentive scheme reduces the number of infrastructure failures according to the results. In addition, the estimated effect of the performance incentive schemes suggests that more effort towards preventing train delays is made at the expense of preventing other failures.

Essay 4 comprises an estimation of marginal costs of rail maintenance. The static model produces slightly lower marginal costs compared to previous estimates on Swedish data. The results from the dynamic model show that an increase in maintenance costs in year \( t - 1 \) predicts an increase in maintenance costs in year \( t \). Indeed, there is an intertemporal effect that depends on the performed maintenance activities (governed by the contract design).

Keywords: cost efficiency, contracts, tendering, rail infrastructure, maintenance

Kristofer Odolinski, Economics
Örebro University, SE-701 82 Örebro, Sweden
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1. Introduction

Railway infrastructure provision and train operations have been vertically integrated from their early stages. After periods with at least some intramodal competition, the industry consolidated into a gradually shrinking number of firms. In the U.S., a national regulator was established already during the 19th century to cap the negative consequences of an increasingly monopolistic industry, while Europe chose nationalization of its railway services during the 20th century.

The paradigm of vertical integration of infrastructure provision and train services was broken around 1990. In 1988, Sweden pioneered the creation of a provider of infrastructure access independent from the operation of train services. A few years later, this became the European Community’s state-of-the-art institutional structure for saving an industry in financial trouble. While most of Europe’s providers of infrastructure access primarily use in-house resources in order to keep the infrastructure in acceptable conditions, Sweden has chosen to contract out maintenance, renewals as well as investment projects. These reforms were preceded by the reforms in Britain were infrastructure services were contracted out, resulting in concerns over the quality of the track.

The transformation of the railway industry and the perspective taken by the public sector was early a core subject of economic analysis. For example, why does the public sector own and/or regulate the production and pricing of certain goods and services, and why should the public sector be involved in this matter? These are positive and normative approaches on economic regulation, respectively. The former typically describes the factors that lead to public intervention and the effects thereof, while the latter identifies inefficient outcomes relative to an optimum from an economic welfare perspective and considers policies to reduce inefficiencies. Section 1.1 gives a brief overview of the reforms made in the railway sector and related research on regulation and competition.

The use of competition for the market in rail infrastructure provision is a less researched area of industrial reforms compared to the transition process and the pros and cons of vertical separation versus integration. This partly motivates the studies in this dissertation. Specifically, this dissertation analyses costs and incentives in rail infrastructure maintenance in Sweden, where reforms of the industry and the associated incentive structures is the common theme throughout the essays. Section 1.2 presents potential effects of competition for the market and how improvements can
be made by estimating the cost efficiency in maintenance production and assessing the effects of incentive structures.

1.1 Reforms in the railway sector and related research

The main positive theories on what drives economic regulation are the public interest theory – emanating from Pigouvian welfare economics – and the interest group theory where Olson (1965) and Stigler (1971) are important contributions. The public interest theory uses the principle that the regulator attempts to correct an inefficient market in order to maximise social welfare. Hence, the explanation for economic regulation is the existence of market failures such as the presence of natural monopoly characteristics\(^1\), externalities, asymmetric information, and public goods. In contrast, the interest group theory – which is a part of public choice theory – points out how different interest groups influence regulation, which does not necessarily serve the interest of the public. This theory does not require a market failure for explaining the existence of regulation.\(^2\)

The normative approach on regulation, which relies on positive analysis of how agents interact, presents optimal regulation policies in different settings. Baron and Myerson (1982), Sappington (1983) and Laffont and Tirole (1993) are influential contributions to this area of research, where asymmetric information is an important aspect that complicates the solution.\(^3\)

Up until 1980, the railway sector was often seen as a typical example of a natural monopoly where the government needed to intervene and reduce market inefficiency by the means of regulation. Indeed, rail infrastructure provision and train operations were to a large extent owned and/or heavily regulated by the public sector during a large part of the 20\(^{th}\) century. However, the benefits of public ownership and regulation of railways

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1 A simple definition of a natural monopoly is that the market equilibrium results in one firm producing the output (Tirole 1988, p. 20). A more formal definition includes the presence of a subadditive cost function in the multiproduct case (see Baumol 1977), while the existence of economies of scale is a sufficient condition for the single product case (see for example Viscusi et al. 2005, p. 406-407).

2 Laffont and Tirole (1991) point out that the positive models overlook the issue of information asymmetries and proposed an agency-theoretic approach to regulation which they use in a model on regulatory capture.

3 See Armstrong and Sappington (2007, chapters 2 and 4) for an overview of optimal regulation in the monopoly setting.
started to be questioned when competition from other modes increased and more subsidies from the public were required to cover costs (Savignat and Nash 1999). The increase in intermodal competition implied that the case for the existing solution became weaker from a normative perspective. Furthermore, from a positive perspective, the effects of intermodal competition definitely made it more difficult for both the regulator and the regulated to maintain the status quo of regulations. Besides, two types of intramodal competition (competition within the same mode) can reduce the adequacy of a regulation policy intended to reduce market inefficiencies: 1) parallel competition (the railways in the US and Canada are two examples), which is possible with high enough demand for railway services, and 2) source competition (the railway in Mexico is an example where the reforms made were dependent upon this type of competition)4, which is possible if a producer (customer) can choose another source and costumer (producer) of a certain good (Pittman 2007).

Intermodal competition has its limits as other modes are not perfect substitutes to railway transport. Likewise, parallel and source competition are often far from perfect. A railway firm may therefore still enjoy monopoly power within its market due to its subadditive cost structure. However, Demsetz (1968) suggested that a lack of competition within a market does not rule out competition for the market, where producers take part in a bidding competition for a contract which can reduce the monopoly firm’s rent. The proposition by Demsetz is possible under the conditions that inputs used in production is sold on a competitive open market and that the cost for the bidding parties to collude is high enough to create a competitive bidding process. Another alternative, suggested by Baumol et al. (1982), is the contestable market which does not require a bidding process for a contract. Instead it is potential entrants that reduce monopoly rents. That is, the potential competition makes the monopolist (or a low number of producers) behave competitively. A perfectly contestable market relies on costless entry and exit, which for example implies that the market should not have any sunk costs. Production will of course always involve some degree of sunk costs. There can also be other barriers

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4 There are three private railroads around Mexico City that serve different destinations. A shipper can use either of these to send or receive goods. That is, a producer and costumer are not constrained by a single origin-destination pair as either one of these can choose a different customer/producer using a different origin-destination pair. (Pittman 2004)
such as an incumbent using its control of inputs and aggressive pricing, or an immobility of consumers because of switching costs (Armstrong and Sappington 2006). Hence, a market is in reality not completely contestable.

The reliance on intermodal competition, as well as parallel and source competition, can explain the reforms made in the U.S. in 1980 and in Japan in 1987, which are two examples of countries that kept a vertical integration between infrastructure management and train operations. The vertically integrated firms in Japan are also subject to regulations that establish yardstick competition, as originally formulated by Shleifer (1985).

Countries in Europe chose a different path by a vertical separation of its railway sector, where Sweden was the first to do so in 1988, mainly due to the growth of required subsidies to the state-owned railway company (Nilsson 2002). Contestability can partly explain the chosen reforms in Europe where train operation was, to various degrees, subject to competition while infrastructure management was kept as state-owned monopolies (apart from Great Britain where the rail infrastructure company was privatised in 1996).\(^5\) Undoubtedly, rail infrastructure has a high level of sunk costs and is less contestable than train operations with rolling stock that may be used on another market – that is, train operations do not have the same entry and exit barriers as infrastructure provision. The move towards an open competition for train operations has however been slow in Europe, with mainly competitive tendering being used. Still, Sweden introduced open access to freight services in 1996 and to passenger services in 2011, while Germany at least nominally opened up for entry and on-the-tracks competition right from the start of the vertical separation (Nash et al. 2013).

The vertical separation in Europe required the introduction of track access charges, which is an important instrument for an efficient use of resources.\(^6\) According to the charging principles determined by the European Union (Directive 2001/14), the access charges should be set to the marginal cost of wear and tear (among other costs). Research on marginal costs typically uses historic cost data which, however, does not necessarily reflect efficient costs (see for example the seminal paper by Johansson and

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5 The British railway network became once again state-owned in 2002.
6 See van de Velde et al (2012) for a thorough treatment of the costs of incentive misalignment that vertical separation can create in the railway sector.
Nilsson 2004 which uses an econometric top-down approach). This may be the case for many countries in Europe that has continued to use in-house production for their rail infrastructure provision instead of a Demsetz competition for the market via tendering of contracts, which has the potential of improving cost efficiency. There are also possible disadvantages. These issues are treated in the following section.

1.2 Competitive tendering and incentive structures

The introduction of competitive tendering can create benefits not available when only using a regulated in-house production. Importantly, it is possible to extract more rent from the monopoly producer when there is competition for the market. The rent is originally created by an information asymmetry between the regulator and the monopoly producer, where the producer withholds information that is important for a cost efficient production. A well-specified regulation policy can extract this rent from the producer, yet competition for the market can reduce the rent even further. Additionally, competitive tendering increases the probability of choosing a skilled producer which can reduce the production costs (sampling-benefit).7

Asymmetric information is more specifically an informational constraint that can lead to adverse selection (asymmetric information about exogenous factors, which allows the producer to extract rent) and moral hazard (hidden action - that is, effort is not observable). The use of different incentive schemes can alleviate these problems, where a trade-off between extracting rent from the producer and inducing effort is required (and as previously noted, competitive tendering can further reduce the problem of asymmetric information). A stylized example in Laffont and Tirole (1993, p. 40) is the use of a cost-plus contract if the regulator wants to extract rent from the producer, whilst the use of a fixed-price contract is preferable when the objective is to induce effort. An incentive contract is a mix between these contract types, where the incentive intensity (the power of the incentive scheme) will determine the trade-off between inducing effort and extracting rent. Moreover, the use of performance payments can contribute to the end result in a situation with informational constraints. Still, care needs to be taken when introducing performance payments, as shown in the seminal paper by Holmström and Milgrom (1991).

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7 See for example chapter 4 in Armstrong and Sappington (2007) for an accessible illustration of benefits in this context.
on multitask principal-agent problems. The effects of the (un)intentional trade-off between different tasks created by performance incentive schemes can be important to measure.

There are possible disadvantages with competitive tendering compared to in-house production. For example, the difficulty of specifying quality and its verifiability will affect the outcome. As pointed out by Hart et al. (1997), in-house production can be preferable to contracting out to private firms when important quality aspects are ex-ante non-contractible and innovations on quality are not important. This is the case even though an in-house production unit has weaker incentives for investments in cost reductions, as well as for investments in quality, compared to the contracted firm. The detrimental effect in this case is that the firm will tend to focus too much on cost reductions compared to quality. Moreover, a regulator needs to consider transactional constraints which can induce higher costs when contracting out the production. For instance, transaction costs occur because of future contingencies (see for example Williamson 1976). These contingencies makes is more costly to write long-term contracts that nonetheless have the benefit of inducing more investments in quality as the producer can recover its investment costs.

In view of these different constraints, it is vital to consider the characteristics of the industry when formulating a regulatory policy and designing contracts. Compared to other industries, the tendering of railway maintenance poses some challenges on its own. One example is the interdependence with renewals; maintenance activities are carried out on a structure with a long expected service life, yet future contingencies make it costly to write long-term contracts. Specifying and monitoring quality is thus an important aspect in railway maintenance. Moreover, on heavily trafficked lines, access to tracks is restrictive and a welfare maximising maintenance strategy requires a balance between traffic, maintenance costs and track quality (which affects the probability of train delays).

The internal organisation of the infrastructure manager is also an important aspect in creating a cost efficient maintenance production. A large organisation may well have different working procedures between different units even though there is a central planning unit or a manager giving (more or less clear) instructions. Reasons for differences in performance due to management practices are examined in Gibbons and Henderson (2013), who also explore why these practices do not spread easily. One reason can be that efficiency gaps within the organisation are unknown. Thus, estimates of the relative cost inefficiency between units are useful for
internal benchmarking. A related issue is the size of the contract areas chosen by the infrastructure manager, which will determine whether economies of scale are fully exploited or not.

There are clearly many different elements to consider when regulating or reforming the railway sector and the effects of reforms and incentive structures are not obvious.
2. The essays

This dissertation comprises four essays on costs and incentives in railway maintenance. More specifically, the essays study the effect of competitive tendering, the relative cost efficiency between different organisational units, effects of incentive intensity and performance incentive schemes, as well as the marginal cost of rail infrastructure maintenance. A summary of each essay is presented below.

The essays primarily make use of data from the Swedish Transport Administration (Trafikverket), however, the studied time periods vary slightly. The first essay uses a panel data set over years 1999 to 2011, while essays 2 and 4 extend this period to 2013. Essay 3 is restricted to the period 2003-2013 due to data availability for the issue addressed in that study.

2.1 Essay 1 – Assessing the cost impact of competitive tendering in rail infrastructure maintenance services: evidence from the Swedish reforms (1999-2011)

The Swedish rail infrastructure management was reformed in 1998 with the internal separation between the production unit and the administrative unit, creating a client-contractor relationship within the organisation. A decision to gradually expose the maintenance of railways to competition was made a few years later, and the first contract was tendered in 2002. This essay estimates the cost impact of this reform.

There has been little or no evidence on the cost impact of competitive tendering in rail maintenance. This essay fills a gap in the literature, where the findings are relevant not just for Sweden but to other railways across Europe and elsewhere, for example the U.S. where very little track maintenance work is sub-contracted.

A decision to contract out services is often driven by the desire to cut costs by the introduction of competition for the market. Nonetheless, the results are far from known a priori. Competitive tendering of railway maintenance may be problematic as maintenance activities can have an effect on the need for future maintenance and renewals, whilst long-term contracts are costly to write and enforce. Moreover, the restrictive access to tracks requires a balance to be struck between train operations, maintenance costs and track quality. Added to this, Great Britain had a negative experience with concerns over track quality leading to increased costs and ultimately bringing back maintenance to in-house production.
A random effects model is estimated on a panel data set over the period 1999 to 2011, including a set of variables to control for the heterogeneity in the production environment. As a robustness check, we test for possible selection bias that can be present if areas with high (low) maintenance costs were tendered because they had high (low) maintenance costs. No such bias was found.

The estimation results show that competitive tendering reduced costs by around 11 percent, without any associated falls in quality. Hence, the evidence from Sweden contrasts the negative experience in Great Britain. A noteworthy difference is Sweden’s gradual exposure to competition compared to the British “Big bang” approach, suggesting that competitive tendering can benefit from learning-by-doing.

### 2.2 Essay 2 - Benchmarking in a publicly owned monopoly: estimating the dual-level cost efficiency of railway maintenance in Sweden

Even though the effects of competitive tendering have been assessed, there is still a procuring client that might lack evidence on its own performance. Identifying efficiency gaps are essential for an internal benchmarking and making cost efficiency improvements.

Improved cost efficiency has been an important basis for reforming the rail infrastructure provision in Sweden. Apart from exposing in-house production to competitive tendering, the reforms comprise changes within the infrastructure provider’s organisation, going from a decentralised organisation to a more centralised organisation. The internal changes suggest that there has been, and may still be, variability in the performance between units. Moreover, differences in contract design suggest performance differences within units.

This essay estimates the cost efficiency of railway maintenance regions and contracts in Sweden using a stochastic frontier model on a panel data set stretching from 1999 to 2013. The long panel also makes it possible to track contract areas that have been tendered more than once.

The results show that there are efficiency gaps between regions and that these vary over time. There are also differences within regions, and we conjecture that differences in contract design may explain some of this variation in cost efficiency. With respect to tendering, the effect of subsequent contract periods indicates a further cost reduction compared to the first period of tendering. The difference is however not statistically signifi-
cant. There is also a significant increase in costs during the last three years of the studied period. The cost increase is disquieting considering that almost the entire network had been tendered in competition in the last three years of the studied period. Furthermore, the results show that economies of scale are not exhausted. There is therefore reason to reconsider the size of certain contract areas.

2.3 Essay 3 – Contract design and performance of railway maintenance: effects of incentive intensity and performance incentive schemes

Contract design is critical for the cost efficiency of a project. Asymmetric information between the client and the contractor necessitates a careful specification of quality requirements and incentive schemes in order to reap the potential benefits of contracting out instead of using in-house production. Empirical evidence on the effect of the chosen designs is also essential for improving the performance of the infrastructure provider and its units.

Different contract designs have been used for railway maintenance in Sweden, which makes it a fruitful case for empirical study on the effects of incentive structures. More specifically, the incentive intensity (the power of the incentive scheme) varies between contracts as measured by the cost-reimbursement rule for rectifying infrastructure failures. This variation enables an estimation of the marginal effect of incentive intensity within the cost-reimbursement contracts, rather than comparing different contract types which is common in the literature. Moreover, the maintenance contracts include a bonus or penalty with respect to the outcome in different quality measures. The structure of these performance incentive schemes is tilted towards train delay failures. Hence, this essay also adds to the literature on performance payments, focusing on the reallocation of efforts.

Two theoretical models are used to derive the expected effects of the incentive structures, which are confirmed by the econometric estimation results. The estimates show that an increase in the incentive intensity reduces the number of infrastructure failures. However, we cannot state to what extent this effect is caused by differences in efficiency among producers or differences in effort level. This relates to the renowned trade-off between rent extraction and effort inducement that needs to be made by the client, and implies that increasing the power of the incentive schemes is
not always the best option because it will increase the possibility for efficient producers to extract rent. Furthermore, the estimation results show that the tilted performance incentive schemes have generated a significant difference between the number of train delay failures and other failures. This suggests that more effort towards preventing train delays is made at the expense of preventing other failures. The long-term effect of such performance incentive schemes needs to be further investigated, especially considering the negative experience in Britain where misaligned incentive structures have arguably led to a deteriorating asset condition.

2.4 Essay 4 - Estimating the marginal cost of rail infrastructure maintenance using static and dynamic models; does more data make a difference?

Reforms and incentive structures will determine the maintenance activities performed, which in turn can have an effect on the required maintenance in subsequent years. This will shape the marginal cost of maintenance with respect to infrastructure use and the effect can certainly be intertemporal.

The policy relevance of marginal cost estimates in rail infrastructure provision became apparent after the vertical separation between infrastructure management and train operations: track access charges needed to be introduced. The charging principles, established by the European Union in 2001 (Directive 2001/14), state that operators should be charged for the wear and tear (among other costs) caused by traffic. A charge equal to the marginal cost ascertains an efficient use of the infrastructure.

A number of econometric studies have estimated the marginal cost for wear and tear using static models. This essay estimates the marginal cost of rail infrastructure maintenance, using a considerably longer panel dataset compared to previous studies. One motivation for re-estimating the marginal cost is the organisational reforms made since the last cost estimations.

In addition to a static model, we use a dynamic model to study the intertemporal effect of maintenance costs; a change in maintenance costs in year $t - 1$ (which for example is caused by an increase in traffic) can have an effect on maintenance costs in year $t$. The use of a dynamic model to analyse rail infrastructure costs is rare, where a previous study on a short panel of Swedish data is a notable exception. The resulting marginal cost is however fully consistent with the standard definition of short-run mar-
ginal costs: a change in traffic triggers not only immediate but also subse-
quently maintenance activities.

The cost elasticity and the marginal cost in the static model are some-
what lower than previous estimates on Swedish data. We can however
conclude that the estimated cost elasticity is in line with previous estimates
in a European context.

The estimation result from the dynamic model contrasts earlier results.
More specifically, we show that an increase in maintenance costs in year
\( t - 1 \) increases maintenance costs in the following year. Hence, there is an
intertemporal effect of maintenance activities, where we can conjecture
that the contract design plays a significant role.
3. Conclusion

The introduction of competition for the market can be a strategy for a benevolent social planner trying to maximize social welfare, or it may (also) be the result of different actors’ influence on regulation. In any case, careful planning and design of contracts is critical for achieving the stated objectives with competitive tendering. Research is then necessary for measuring delivery against the objectives of a reform. Moreover, when competition for the market is introduced and evaluated, there is still a procuring client that might lack evidence on its own performance. The use of estimates on the relative efficiency within the client’s organisation can be useful in this respect.

This dissertation presents empirical evidence on the cost impact of introducing competitive tendering of rail infrastructure services, the relative cost efficiency between and within organisational units, as well as the effects of different incentive structures in contracts. The marginal cost of railway maintenance is also estimated, partly motivated by the extensive organisational reforms made since the last estimates on Swedish data. The findings are relevant to railways across Europe, as well as the U.S. where little maintenance is sub-contracted.

The purpose of railway infrastructure maintenance is to facilitate the implementation of railway services as specified in the annually revised timetable, and to do so at lowest possible costs. The results indicate that competitive tendering in Sweden has, at least initially, been beneficial with respect to cost efficiency. There is however room for improvement and recent increases in costs call for further attention. The estimates at hand show that economies of scale are currently not fully exploited. The size of certain contract areas may therefore be reconsidered. There are also other efficiency gaps that can be narrowed, where differences in contract design might explain a part of these gaps.

It is demonstrated that increased incentive intensity results in fewer infrastructure failures. While it may be tempting to conclude that higher incentive intensity would only be beneficial, the optimal regulatory design proposed by Laffont and Tirole (1986), suggests that this can be costly. Rather than having the tendering agency to formulate one contract type with high incentive intensity, there is reason to consider a possibility to let the firms choose from a menu of linear incentive contracts, that is, from contracts with different incentive intensities. This would make it easier for less efficient firms to survive, maintaining the competitive pressure and
curbing the (future) risk for (the most efficient) firms to extract rent due to their private information on (exogenous) factors important for efficient cost production.

The presence – and indeed the purpose – of performance incentives is to induce contractors to make a trade-off between different activities. In particular, the structure of the performance incentives is designed to reduce train delays, which they seem to do. This comes at the expense of less effort directed towards a deteriorating quality that does not manifest itself in current traffic disturbances. There is, however, a possibility that this has long-term effects on infrastructure quality. This relates to the trade-off between short- and long-run welfare maximisation, which has not been possible to analyse in this dissertation. Future research needs to assess how different contract designs affect both user and producer costs in order to suggest improvements in this trade-off. It requires data on the size of each train delay and its effect on total delay time for users. Only the frequency of failures causing train delays (together with other infrastructure failures) was available for the analyses in this dissertation, which limits the conclusions that can be drawn.

The fourth essay contributes to our understanding of infrastructure wear and tear caused by track use, which is indispensable for creating an efficient use of the infrastructure via track access charges. From one perspective, and as witnessed by the title of the essay, the question is if better data – in particular a longer and more coherent time series than used in previous research – makes any difference to the estimation results. The short answer is that the estimate of marginal costs, and in particular the underlying elasticity of costs relative to traffic, is remarkably stable. Previous studies in Sweden and in other European countries have established that the elasticity is well below 0.5, and this is corroborated by the new data. This holds in spite of considering the intertemporal effect of maintenance costs, where a change in track use in one year can have an effect on maintenance costs in subsequent years.

The size of the intertemporal effect estimated in the fourth essay is to a large extent determined by the infrastructure provider’s ability to respond to changes in the production environment and provide suitable incentive structures. However, the understanding of costs from a long term perspective remains an unresolved question, not only to establish appropriate contracts but also in order to set efficient (short run) marginal cost prices. For example, one incompletely understood aspect concerns the balance
between resources spent on renewals rather than current maintenance and its impact on user costs.

Indeed, a thorough understanding of an industry’s characteristics and the effect of the existing incentive structures is of utmost importance for explaining the current state and making improvements with respect to stated objectives. This dissertation has provided some evidence on costs and incentives in rail infrastructure provision which can be informative for future decisions. There is however more to be done within this research area. We reiterate and conclude that future research needs to analyse reforms and incentive structures with respect to their long-term effects on both user and producer costs. Incentive structures that are beneficial in the short run need not be so in the long run, which can especially be the case when managing an asset with a long expected service life.
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