Submission

Productivity Commission Inquiry

Progress in Rail Reform

Peter Forsyth

Keith Trace

Department of Economics

Monash University

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Executive Summary

Our submission focuses on changes to the institutional environment in which the rail industry operates which need to be addressed in order to enhance industry performance. We begin by arguing that the technical and allocative efficiency of existing state rail systems is low. Despite reductions in rail costs in the 1980s and 1990s, cross-country disparities in cost levels remain substantial.

We argue that there are four areas in which the level of rail efficiency causes concern:

a. **the adequacy and allocation of investment:** we note evidence that Australian rail systems have tended both to under-invest and to choose poorly between different investment projects. We note the importance of incentives as a way of ensuring rational behaviour and argue that managers of state rail systems have not received the correct signals. We argue further that profit maximizimg privately owned firms are more likely to invest efficiently and effectively. We stress the problem of investment incentives for price-regulated firms and conclude by stressing that careful thought must be given as to the type of environment most suited to rational investment decisions.

b. **cost minimisation:** we begin by citing evidence that Australian rail systems incur markedly higher costs than those incurred by the most efficient overseas rail systems. We argue that the strongest pressures for cost minimisation exist in privately owned, profit maximizing firms operating in competitive markets.

c. **pricing:** getting prices right is an important aspect of allocative efficiency. We argue that state rail systems may in theory price efficiently, providing managers are given the appropriate incentives. In contrast, a private firm will tend to adopt an efficient price structure, but will use market power where it can. Overall, we argue that while state rail systems may be indulging in inefficient pricing practices, these are unlikely to create major welfare losses.

d. **product coordination, diversity and quality:** are the state rail systems providing services of a type(s) that users really want? We argue that state rail systems tend to provide services of a given quality and type irrespective of customer needs. In particular, we argue that state rail systems do not have strong enough incentives to co-operate with each other to provide efficient and effective interstate services.

Institutional and Structural Options

We suggest that four questions need to be addressed: how much private ownership? what industry structure (notably how much vertical and horizontal separation)? how much competition? how much (and what type of) regulation?

We argue that private ownership has several desirable features. A profit orientation promotes three of the four elements of efficiency (investment, cost minimisation and product co-ordination). However, we recognise that where market power is present, as it is sometimes in rail, the profit oriented firm will price too high and sell too little.

When considering industry structure, we argue that some degree of amalgamation of the present rail systems is probably desirable. We believe this would reduce coordination costs, while detracting little (if at all) from competition. We see both advantages and disadvantages in vertical separation. Whilst vertical separation enables more competition at the train operating level and may make firms easier to regulate, it may result in increased costs for the rail system as a whole. We argue that access price regulation will pose more problems of adequate quality and investment under vertical separation.

We consider competition desirable in order to promote productive efficiency in the provision of train operations, to encourage product diversity and integration, to promote efficient investment, and to promote efficient price/quantity decisions. Equally, we argue that the downside of competition is that it necessitates access price regulation which, in turn, imposes costs.

The case for regulation depends on the form of ownership and the structure of the industry. In general, we do not fear market power in rail. If regulation is imposed, the preference is that it be national rather than state based. Separate access regulation imposes considerable transaction costs on operators.

We argue that government has a role as a regulator and as an organiser and/or funder of community service obligations.

Conclusion

We conclude by offering our assessment of the reform options (see Table 2). We favour moves toward private ownership on efficiency grounds and argue that the potential to misuse market power is not of major concern, subject to effective access arrangements. However, private ownership will require close attention to the provision of community service obligations (CSOs) and we suggest the outcomes of privatisation will be more satisfactory if an efficient access regime is in place.

In our view, horizontal separation has little to offer. It creates problems of inter-system coordination, although these will be minimised with private rather than public ownership. A nationally consistent access regime would minimise coordination problems.

Our verdict on vertical separation is mixed. Whilst the separation of track and train provision may enable more effective competition at the train operating level, economies of integration may be lost and access regulation will become more difficult. We argue that regulated, vertically separated firms have less of an incentive to provide desirable service levels than vertically integrated firms. The scope for road-rail integration differs as between vertically integrated and vertically

separated systems. In a vertically integrated system with a dominant service provider, ownership of both freight forwarders and rail systems might dramatically reduce competition. However, some degree of common ownership of road-rail might be of less concern in a vertically separated environment with several rail operators.

Whilst we regard final product price regulation as undesirable, we consider access pricing to be desirable, though we note that it does have costs. We are concerned that access pricing regimes may lead to undersupply and underinvestment.

We note whilst the provision of CSOs is a political decision, the way in which such CSOs may be funded depends on the nature of the reforms introduced.

1. Introduction: Choosing the Institutional Environment for Rail

This submission is about changing the institutional environment in which the rail industry operates so as to improve its performance. The term 'institutional environment' is a broad one, including ownership and incentives, firm structure, competition and regulation. The current environment is not conducive to good performance; Australian railways are rarely regarded as good performers. By good performance we mean performance which is not only economically efficient but which meets other community objectives. Over the past decade or so, rail's poor performance has been recognised, the institutional environment has been changed, and significant improvements have been recorded. For example rail systems have been corporatised, there has been some vertical separation, and the new access regimes are making some competition possible. Rail productivity has been increasing and real prices have been falling.

Studies by the Industry Commission (Productivity Commission) and the Bureau of Industry Economics suggest that the performance of state owned rail systems leaves much to be desired. For example, the BIE (1992, 1993, 1995) evaluates three aspects of performance:

- customer oriented performance (rail freight charges and service levels): the BIE shows that Australian rail freight charges, especially for coal (for which NSW rates are about 60% higher than US rates) and grain, are significantly higher than North American rates, while the reliability of rail, whether measured by transit time or on-time arrival, is inferior to that of road transport;

- operating efficiency: the BIE shows that Australian rail systems lag well behind 'best practice', represented by the performance of the most efficient North American systems. There was a more than tenfold difference between the worst performing Australian and the best performing US railroad. The BIE has estimated that productivity growth in the Australian systems in the late 1980s and early 1990s was good, and had narrowed the performance gap. The BIE indicators show the scope for improvement in the operating efficiency of Australian rail systems; and

- analysis of the performance 'gap' between Australian systems and overseas 'best practice': the BIE analysis indicates that, overall, Australian rail systems would have to reduce their 1993/94 operating costs by about 24% to match global 'best practice' (BIE, 1995, xv ii).

The objective of this submission is to explore which of several possible institutional environments is most likely to lead to good performance. The problem is a complex one- it is not just a matter of implementing a few chosen reforms. Moreover, elements of several of the possible reform options are, in part, contradictory. Thus a package of reforms must be devised, and any package chosen will inevitably involve trade-offs. First best solutions may not be easy to implement: second best options may be all that can be hoped for. This submission seeks to highlight possible options, and the trade-offs associated with them.

2. Efficiency Problems in Rail

As with any industry, there are some aspects of efficiency which are particularly important. In our view, there are four main areas of concern when considering the efficiency of rail transport.

a) investment: especially issues relating to its adequacy and allocation;
b) cost minimisation;
c) pricing;
d) product coordination, diversity and quality.

Firstly, the problems with rail investment are widely acknowledged. It is often argued that there are unrealised investments in rail infrastructure which would yield large dividends, making rail services better and more competitive. But it is not entirely a matter of rail being starved of funds, as less worthwhile but politically popular projects often get funded. There may, however, be a general problem of insufficient funding going to the industry.

Whilst a case may be made for rail being starved of investment funds, the allocation of investment as between rail projects also appears flawed. For example, the Commonwealth, South Australian and Northern Territory governments have each committed $100 million to the proposed Darwin-Alice Springs rail line. However, the forecast rate of return on the Darwin-Alice Springs line is low compared to that available from other rail investments. Consultants commissioned by the Committee on Darwin estimated a Benefit Cost Ratio of only 0.8 (Trace, 1997, 523), whilst a later study by the South Australian and Northern Territory governments estimated a Benefit Cost Ratio of 1.27. Even if we accept the latter estimate, the net benefits of the Darwin-Alice Springs rail line are significantly less than those obtainable from other rail investments, let alone those from other transport projects. Benefit Cost ratios for the upgrading of sections of Australian National's East-West tracks, as well as for the repair and restoration of sections of the Melbourne-Adelaide standard gauge track are significantly higher than those for the Darwin railway (Trace, 1997, 527).

Secondly, in recent years, Australian railways have improved their productivity; however, there is scope for further productivity improvements and cost reductions. Realisation of potential cost reductions could be the largest single source of benefit from rail reform.

Thirdly, another possible efficiency problem lies in the pricing of rail services. Some prices may be above efficient levels, whereas others may be well below. Pricing has efficiency effects through affecting the share of traffic which road and rail capture. Equally, some cross-subsidisation takes place, though not always to achieve community objectives. This appears to be the case in Queensland, where QR has generated economic rent by charging coal producers freight rates well above the cost of coal carriage. In part, the excess profits generated by QR have been returned to government as dividends. They have also made it possible for QR to maintain via cross-subsidy a larger rail system than might otherwise have been the case (Freebairn and Trace, 1992, 23).

Finally, there are doubts as to whether the rail industry offers the mix of services which the market wants and rail is best suited to provide. It may not be providing services of the quality required; users might be prepared to pay more for higher quality if only it became available. Moreover the different state rail systems remain poorly coordinated, for it is difficult given the existing incentive structures to provide services which rely on the inputs of different systems.

Each of these efficiency problems is examined in greater depth in the next section.

3. Analysing Efficiency

The Adequacy of Investment

Have Australian rail systems made the 'right' investments? In many areas, the poor and deteriorating standard of track has a significant impact on operations - lessening the quality of service and the competitiveness of rail. Bottlenecks may be recognised, but the operational problems to which they give rise are often left unsolved. Perhaps this is the result of inadequate overall funding. State governments are cash constrained, and may be unwilling to invest given the poor financial performance of rail for most of the post-war period. Governments may not trust their rail systems to invest wisely, There may also be problems relating to the allocation of available funds. Rail authorities, subject to government pressures, may invest in high profile projects ("investments in morale" like the NSW XPT train). But such investments may be less rewarding in efficiency terms than more mundane investments in track improvements.

In extreme cases the condition of the track is so bad that rail's ability to compete for freight and passengers is threatened. For example, sections of the Melbourne-Adelaide standard gauge track are in such poor condition that speed restrictions are necessary. Such restrictions lengthen the time taken en route and lower the quality of rail service.

Similarly, whilst the existence of a number of bottlenecks (such as the limited length of passing loops on the NSW North Coast Line and the Sydney-Melbourne standard gauge line) has been generally recognised, funds to address the problems have not been available or have been available in inadequate amounts.

Criteria for efficient investment are simple to specify in theoretical terms, but are much harder to implement in practical situations. Those who make the decisions must be given the incentive to choose the most efficient investments. A public enterprise may be set several conflicting objectives by its owner. Whilst economic efficiency may be one of these objectives, the simultaneous pursuit of several, mutually conflicting objectives may prevent outcomes which are desirable from an economist's perspective. Ideally such an enterprise will subject its investment projects to discounted cash flow analysis, which can take account of the impact of the project on the enterprise's profit. The enterprise should then choose to invest in those projects which achieve the highest return. Typically practice falls well short of

this theoretical ideal. Further, with rail investments, there may be costs and benefits other than the firm's profits - ideally these would be taken into account using the more inclusive cost benefit analysis. Public sector managers may be exhorted to invest wisely, but they are rarely given the incentive to do so. In reality they may be subject to many pressures to do otherwise. To date, the problem of creating workable incentives to ensure efficient investment programs in public enterprises has not been solved: the state rail systems are not the only examples of poor investment programming.

In contrast, we may assume that a profit-oriented private firm will invest effectively to ensure achievement of its profit objective. If profit maximisation is consistent with the maximisation of overall social welfare, as it will be in competitive markets with no externalities, there will be an efficient level and pattern of investment by the firm. In turn, investment will reduce costs, enable increases in output, and/or result in improvements in the quality of output. The firm will be able to capture these benefits in higher profits.

The unconstrained profit maximising firm, however, is not an apt description of Australian rail systems (with the exception of private mineral railways). Corporatised state rail systems may mimic the behaviour of private firms. But whilst they may be somewhat profit-oriented, they are likely to be constrained by their owners from too aggressive a pursuit of profit, and they are likely to be set non-profit objectives. Rewards to managers are unlikely to be closely related to profit performance. If this is the case, they will have a weak incentive to ensure efficient investment. Whilst corporatisation in Australia has meant a move to a more commercial focus, and has resulted in a change in the form of the enterprise, it has not resulted in enterprises focused primarily on profit, nor has it been characterized by managers with a strong incentive to maximise profits.

Investment-related problems emerge when a private firm is subject to price regulation. If there is rate of return regulation, incentives for excessive investment are created. This is one of the reasons for the move towards price-cap regulation, which is being increasingly adopted in Australia. The investment incentives of this type of regulation are perverse. If investment leads to lower costs or increased demand, the firm will be able to capture the benefits as increased profits. If, on the other hand, investment leads to benefits such as less congestion or improved service quality, these will accrue to the user. The rail system may be able to capture a proportion of the benefits as a result of an increase in demand, but it will not be able to raise its prices (even though users would be willing to pay for the higher quality). In short, since the rail system will not be able to capture all the benefits of the investment, it will tend to invest less than is socially desirable.

The problem of investment incentives for price-capped firms is now recognised as a serious one (Armstrong, Cowan and Vickers, 1994, ch.3). In some cases, regulators have had to pay very careful attention to investment issues. Thus, in the case of BAA airports in the United Kingdom, the regulator offered the firm a more generous price-cap if it invested in more terminal capacity for the benefit of users (Forsyth, 1997). It may be possible to conclude agreements which ensure more efficient investment, but only if the regulator has a much more direct role in assessment and

choice of investments. It will be the regulator rather than the firm which chooses which investments to make. This may be workable in the case of major investments such as airport runways, but it will be unworkable when a multiplicity of day to day investment decisions need to be made (ie. track upgrades).
Clearly much thought needs to be given as to the type of environment which will create the right incentives to invest in the rail systems in Australia. Historically, the environment has been unsuitable, and the problems created are self-evident. However, the environment to which the systems are moving, one of corporatised or private rail enterprises subject to caps on access prices, is likely to give rise to continued problems of insufficient and poorly allocated investment.

Cost Minimisation

Possibly the single most important aspect of efficiency in the context of rail is productive efficiency: whether the systems are as productive as they can be and whether costs are minimised. The evidence for Australian rail systems is that costs have been well above minimum possible cost, and that achievement of best practice would yield major benefits. Over the past decade, there have been substantial gains in productivity, but as of 1993-4, the costs of best practice overseas levels (BIE, 1995) overseas were still estimated at 24% below those of the Australian systems.

[A historical note: International comparisons of railway performance are not new. In 1915 the Bureau of Railway Economics, in Washington DC, published an international comparison of rail freight rates in the US, Australia and Europe (Bagwell, 1968, 76).]

Productive efficiency depends on incentives, the availability of subsidies and constraints on the systems. It is not surprising that rail systems have performed poorly, granted that there were few incentives for managers to reduce costs, and granted also that subsidies were readily available if the systems could not compete with other modes. Moves towards corporatisation have resulted in enterprises that are somewhat more focused on profit and costs than their predecessors. This attitudinal change can be attributed to tighter financial constraints put on the railways by their government owners; the railways have had to cut costs to make ends meet. Financial squeezes are, however, a poor way of improving productivity, since the enterprise will be forced to cut expenditures, such as maintenance, which are worthwhile in the long run, as well as reduce their investment spending. Some of the problems noted in the previous sub section are probably due to financial constraints.

Probably the clearest incentives for cost minimisation occur in privately owned, profit maximising firms operating in competitive markets. Cost reductions translate into profit increases, and as long as managerial incentives are closely related to profit such firms may be expected to minimise costs.

Prices and Quantities

Getting prices and quantities right is an important aspect of allocative efficiency. Ideally prices should be set at marginal cost. In practice this will probably be

inconsistent with full cost recovery. The second best solution is for prices to be set so as to recover costs at minimum deadweight loss or so as to reflect the marginal welfare cost of taxation to provide funding of subsidies. This will involve pricing so as to take account of both marginal cost and demand elasticities (Ramsey pricing) and/or multipart tariffs. (For a discussion, see Freebairn, 1998.)

In Australia, rail's main competitor for the carriage of general and containerised cargo is road, although coastal shipping competes in some markets. Rail has an effective monopoly in the carriage of coal and mineral traffic. In some systems, coal and mineral traffic generates profits which are used to cross subsidise competitive traffics. If this results in prices for these traffics being set close to marginal cost, the result may be a fairly efficient pattern of prices and costs (though it should be recognised that the use of market power on the mineral routes does create some deadweight losses). However, if mineral profits are used to set prices for competitive traffics at below marginal cost, the result will be inefficient, since rail will carry traffic for which it is less suited than its competitors. Further, rail systems carrying mineral traffic may use the revenues to cross-subsidise other traffics. Cross- subsidisation may be the means whereby community service obligations may be met (eg the cross-subsidisation of rural passenger services to guarantee rail accessibility to country towns). Granted that there is a community desire for these services to be subsidised, cross-subsidies may be an efficient, though not transparent, means of achieving this.

One complication to efficient rail pricing arises from road pricing. If road and rail are substitutes, and if road is priced inefficiently, it may be appropriate to take this into account when pricing rail. Thus, if road is underpriced, it may be desirable to set the rail price below marginal cost, to induce traffic back towards rail. However, given the move to more efficient road pricing, it seems unlikely that this is a serious problem today. While road services are not priced directly, road user charges are imposed on freight operators, and it is no longer true to say that road users are failing to pay their way. Furthermore, cross elasticities of demand are not likely to be so high that the share of traffic is sensitive to the rail price. Given the limited information about relevant parameters, it seems unlikely that the adoption of 'second best' pricing by rail to take account of flaws in road pricing will yield gains in efficiency (See Forsyth, 1985).

Under public ownership, rail systems may price efficiently. They will do so if managers are given incentives to maximise overall welfare. However, this is unlikely to be the case. The objectives they may pursue in the traditional public enterprise setting may vary, but a key one may well be size maximisation. Such enterprises will use cross subsidies to enable them to compete in carrying traffics to which they are not suited. However, a corporatised public enterprise with appropriate incentive structures in place may behave like a profit-maximisation private firm.

The private, profit oriented firm will tend to choose an efficient structure of prices, but it will use its market power as much as it can. It will set high prices in some markets, so that there will be the standard deadweight loss due to the use of market power. How much market power the Australian rail systems have is an empirical question. Some, such as those with few mineral traffics, may have little market

power, and any efficiency losses will be small. For those which do possess and use market power, there will be deadweight losses, which may be large or small. It is quite likely that some systems may be very profitable yet the deadweight loss may be quite small: in such systems, regulation may be introduced more to control profits than to promote efficiency. If there is private ownership of rail systems, regulation of either the final product or of access to tracks may be warranted to promote efficiency.

It is important to distinguish between situations of high profitability and high allocative inefficiency. A railway may be reaping large profits from a traffic, though the efficiency cost may be low if demand is inelastic. Regulators and the public are often more concerned about high profits than efficiency, per se. High price and profit situations, however, can lead to inefficiencies if they lead to rent seeking, or costly bypass.

Overall, the pricing aspect of efficiency is probably the least cause for concern in the Australian rail context. Rail systems may be indulging in some inefficient pricing practices, but these are not likely to create major losses. Given the amount of competition for much of the traffic, the welfare losses from private owners using market power are not likely to be large either.

Coordination, Product Diversity and Quality

One of the least obvious aspects of efficiency arises with the products which the rail producers are offering to the market. Are the rail systems providing the services which users want, or might want? A system may be providing a service of quality A while users are prepared to pay more for an A+1 quality service, or might prefer an A-1 quality service at a lower price. We note that the individual rail systems may not have an incentive to find out and provide what the users want. They will simply provide the services they have always been providing. This is a common problem with public enterprises which are either not fully exposed to competition or have access to subsidies, and which are not active in seeking profit. The same will be true of slack private monopolies, which are not forced by their owners to make the most of their profit opportunities.

The coordination problem is as old as the railways themselves. Except over the past fifty years before the recent privatisation, Britain has had a system of independent private rail companies. There were a host of coordination difficulties that needed to be sorted out, including access to each other's lines, pricing of freight on routes involving more than one company, and standardisation of operation. Private companies had an incentive to coordinate, though there were limits to this incentive - in some markets they were competitors. Coordination was achieved through such institutions as the Railway Clearing House - in neither Britain nor the US was it perfect, however. For a history, see Bagwell (1968).

State based rail systems in Australia do not have strong incentives to cooperate amongst each other to ensure that services which require the inputs of more than one system are made available. For example, rather than handling interstate freight, which involves sharing revenue with other systems, state rail systems may prefer to

promote business within their borders. This could especially be a problem when it is a matter of facilitating track access to a third operator, who wishes to use the tracks of more than one system to operate a specialised train.

We argue above that the state rail systems do not have strong enough incentives to cooperate with each other in order to ensure that services requiring the input of more than one system are made available. We would argue further that the individual state rail systems have tended to concentrate on those cargo and passenger flows whose revenues are fully capturable, in other worlds on intrastate rather than interstate flows. The limited development of interstate general cargo and container services is indicative of a general problem.

We would suggest further that the development of state- and commonwealth-based access regimes has compounded the problem. Freight forwarders frequently complain that the existence of multiple access regimes increases both the difficulty and the cost of accessing the rail system. For example, SCT has sought to operate its own trains on the Sydney/Melbourne-Perth transcontinental route. In order to do so, SCT needs to negotiate access to tracks controlled by the NSW, Victorian, Commonwealth and West Australian governments, as well as negotiate for access to freight handling facilities, locomotive servicing facilities etc.

In its *Application for Declaration of Westrail freight support services under s 44F of the Trade Practices Act*, SCT argues that whereas Clause 6(4)(p) of the Competition Principles Agreement provides:

> Where one or more State or Territory access regime applies to a service, those regimes should be consistent and by means of a vested jurisdiction or other cooperative legislative scheme, provide for a single process for persons to seek access to the service, a single body to resolve disputes about any aspect of access and a single forum for enforcement of access arrangements there is in reality no single or consistent access regime and arbitration procedure for the Melbourne-Perth route. (NCC, 1997a, 23)

The existence of several access regimes greatly increases SCT's costs in seeking to provide a transcontinental rail freight service.

It is difficult to judge how serious an inefficiency this is now and is likely to be in the future. It is often thought that rail should be more involved in medium to long haul interstate freight. Operators, such as SCT or Carpentaria (NCC, 1997c), which try to use the access provisions to develop new services find it difficult to negotiate access rights to all the facilities they need. The fact that the limited opening up of rail markets which has been achieved through the access provisions has resulted in new entrants offering different services, in spite of difficulties, suggests that the incumbents have not been actively seeking out markets. There are good reasons for believing that the present environment has resulted in significant inefficiencies of this type. It is thus important that consideration be given to improving the institutional environment so as to minimise such inefficiencies.

The problem is likely to be less severe if there were only one rail system operating in Australia. It would not be necessary to deal with more than one vertically integrated system, transactions (or coordination) costs would be lessened and the system would not be concerned about losing a share of its business to interstate rivals. If such a system were a profit maximiser, it would have a strong incentive to supply all those services which users are prepared to pay for. However, it is not sufficient to have a single system: the managers of the system must have incentives to seek out markets. Neither a public enterprise set diverse and conflicting objectives, nor a slack private firm possessing market power, would be likely to embody such incentives. Regulation too can impact on incentives; a private but regulated firm might not be keen to develop new markets.

We suggest that two types of environment could improve coordination: one in which there were a single track operator across Australia and, perhaps less effectively, one in which there were several systems subject to a single, unified access regime. In each case, it would be relatively easy for new entrants to seek out and develop markets which the established rail operators were ignoring, and the problems of dealing with different state based systems would be minimised.

It is important to stress that the incentive aspects of the problem are more important than the horizontal integration aspects. If there are independent state based rail systems, but they are all keen on profit, there will have a strong interest in making products which users want available; if they need to cooperate with each other, they will be willing to do so. This is so especially where the different systems are regionally based, and do not compete on a head to head basis very much. A fully integrated system covering the whole country can still be slack, and ignore profitable markets.

Incentives, Competition and Efficiency

Efficient performance depends on incentive structures within the firm and the competitive pressures to which the firm is subject. In turn, effective incentives depend on the objectives and rewards offered to managers by the owners of the firm. Firms may be traditional public enterprises, corporatised public enterprises, or private, profit-oriented firms. They may or may not be subjected to competition. The effect of these factors on the incentives to achieve efficiency is summarised in Table 1.

Table 1: Institutional Reform and Efficiency Incentives

Institutional Form	Investment	Production Efficiency	Pricing	Product Co-ordination
Public - Non Corporatised	— —	— — —	?	— —
Public - Corporatised - Monopoly	+	+	—	+
Public - Corporatised - Competition	+ +	+	+ +	+ +
Private - Monopoly	+ +	+ +	— —	+ +
Private - Competition	+ +	+ + +	+ + +	+ +

+ + +	Strongly Positive effect
+ +	Positive effect
+	Weak positive effect
—	Weak negative effect
— —	Negative effect
— — —	Strong negative effect
?	Ambiguous

Private firms subject to competition perform well on all counts, but there are limits to competition in rail in Australia, since natural monopoly elements are present. Private monopolies perform quite well in some, but not in all, aspects. Non corporatised public firms can be expected to perform rather poorly. Corporatised public firms can be expected to perform rather better, especially if they are subjected to competition.

This Table is suggestive but incomplete: some relevant factors, such as the firm's internal structure and regulation, have been left out. These will be important when the options for reform considered, as they are in the next two sections.

4. Institutional and Structural Options

We suggest that the institutional environment in which future rail systems will operate will be determined by choosing one of several packages of options. The relevant options require choices concerning ownership, structure, competition and regulation. Four questions need to be addressed.

a) how much private ownership?
b) what industry structure- how much vertical and horizontal separation?
c) how much competition? and
d) how much, and what type of, regulation?

These options are considered in turn

5. Exploring the Options

Private Ownership and Corporatisation

For present purposes, private ownership can be thought of as a continuum. At one extreme, there is a fully privately owned firm, which is subject to strong pressure from its owners to maximise its profits. We note that not all private firms face such strong pressure and some managers may have discretion over objectives. For example, firms which are protected from takeover may not focus solely on profit. In some firms which are part-government, part-privately owned, the focus on profit is probably less strong than that of purely privately owned firms. We note that public enterprises may be corporatised and their managers given explicit incentives to seek profit. But such firms are rare: more typically, the corporatised public firm has the form of a private corporation and is given broader objectives than simple profit maximisation. In such firms, managers are rarely given strong incentives to maximise profit, although they are normally required to be commercial in their outlook. At the other extreme, there is the pure public enterprise with multiple objectives and minimal pressure to earn profits.

As a rough generalisation, the strength of the incentives to maximise profits is correlated with the degree of private ownership and/or corporatisation. In our view, firm performance in pursuit of the four aspects of efficiency depends on the keenness with which it pursues the profit motive.

A profit orientation is positive for the promotion of three of the four of the aspects of efficiency. As long as it can capture the benefits in the form of increased profit, a profit oriented firm will perform well in terms of investment. It has an incentive to ensure that investment is adequate to meet the needs of users, and it will invest to maintain or improve quality since it can charge more for higher quality services. It will have as strong an incentive as any firm to minimise costs, since low costs mean high profits. It will have strong incentives to provide the market with what it wants, to provide product diversity and to innovate. Where provision of a product is conditional on interconnection with another system, profit oriented firms will have an incentive to negotiate between themselves a solution which enables the product to be made available.

Of course, we should not and do not presume that private firms will perform perfectly in terms of these aspects of efficiency. Slack private firms exist. Thus it will be desirable to strengthen the incentives to achieve greater efficiency by other means, such as increased competition, where possible.

Private ownership and profit orientation can pose problems with the price/quantity aspects of efficiency. If market power is present, the profit oriented firm will price too high and sell too little. Rail systems certainly have market power in some areas, especially in the carriage of coal and minerals. Their market power in other segments, notably general freight and passengers, is limited and may not pose too much of a problem. We note that profit oriented firms will not, of their own accord, subsidise particular groups of customers. If there are community service obligations which require particular services to be subsidised, such services will have to be directly subsidised or subsidised through regulation forcing the firm to sell particular

services at particular prices. Market failures will also arise when externalities are present, but there is no reason to expect these to be more of a problem with profit oriented than with other firms.

On balance, this suggests that private ownership and/or a strong profit focus is strongly desirable for rail in Australia. The three most important aspects of efficiency will be enhanced under such a regime. The fourth aspect of efficiency is less important. It can, to an extent, be addressed through regulation, even though regulation creates its own disincentives. Neither private ownership nor corporatisation will provide the perfect environment in which to pursue the three aspects of efficiency. It may be worthwhile increasing the incentives by other means, such as enhanced competition, even though this may impose some costs.

Horizontal and Vertical Separation

At present Australia has a horizontally separated rail industry. The national rail system is divided into several regionally distinct, state-based systems. This results in poor coordination and product diversity. It is difficult for the different systems to come to an agreement to provide services which use the facilities of more than one system. This has been true of vertically integrated rail systems, and it is becoming even more of a problem when independent operators, seeking access to the track of more than one system, have sought to operate new services. This is not surprising given the mixed objectives of the different publicly owned systems. A stronger profit orientation would induce the systems to coordinate better with each other.

Having a number of separate systems may enhance competition. It must be recognised that the different systems do not indulge in much head to head competition with each other at present. Any head to head competition would be at the operations level, not at the track or total system level. Only in countries with very dense markets, such as Japan and parts of the US, is full system competition feasible. This could change if the systems become more profit oriented, seeking out traffic beyond their own borders. The importance of inter-system competition also depends on the extent of competition from independent operators using existing tracks of the rail systems (or, if there is vertical separation, the tracks controlled by railtrack authorities). If this source of competition is effective, the case for horizontal separation is weakened.

On balance, some degree of amalgamation is probably desirable. This will reduce coordination costs, while not detracting from competition. Two or three systems, along with independent operators, will probably provide sufficient competition. Mergers between these could be desirable if there remain coordination problems, if independents are strong, and head to head competition is not great.

The issue of vertical separation is more difficult to come to grips with. Vertical separation of track from operations had been adopted as a policy in the United Kingdom (See Joy, 1998b, Bradshaw, 1998 and Swift, 1998) and some Australian states. One advantage is that it enables more competition at the train operation level; no operator has to compete with a fully integrated system, with possible

economies of integration, and probably a long established position of dominance in a regional market. To the extent that this competition is promoted, there is likely to be higher productive efficiency in train operation, and better performance in terms of providing what the market wants. In addition, as long as the market power at the track level is not used, there will be less of a problem of inefficiently high prices.

One obvious downside of vertical separation is that it may result in increased costs for the system overall. There may be economies in producing all stages of the rail product. Track and operations are much more closely related than in other industries, such as roads and road freight. The operation of the track system affects users, and the operation of the users has impacts on the track providers. Such economies are not easy to measure, but it should be noted that rail systems around the world are normally vertically integrated: systems which have a choice of vertical integration or separation do not choose the latter. Separation only occurs when regulators enforce it, as in the UK. This suggests that there are real economies in integrated operation.

A vertically separated system may appear to be easier to regulate. Track can be subjected to a uniform access pricing environment which affects all train operators uniformly. There will be no problem in ensuring competitive neutrality between the integrated system and independent access seekers.

As against this, access price regulation of a separated track system will pose problems of adequate quality and investment. A price-capped rail track enterprise will have an incentive to downgrade quality and skimp on investment. This perverse incentive will be present to a much lesser degree in an integrated system which is subject to access price regulation. This is because the main user of its track will be itself; it will have a strong incentive to provide the efficient quality of track so that its own operations are cost effective. The regulator will have more discretion over the access prices it decrees; it will not need to worry so much about setting prices too low and driving the enterprise out of business, or of discouraging it from investment. While an access regime may not result in as much competition, measured by number of competitors, as with vertical separation, it will also not incur the same costs of regulation.

Under the UK's privatised and vertically separated rail system, Railtrack (now privately owned) has an obligation to maintain the rail network, as well as to improve, enhance and develop it 'to the greatest extent reasonably practicable and 'in accordance with best practice and in a timely, economic and efficient manner.'(Railways Act 1993) Problems arise with provision of additional track capacity to cater for the growth in traffic that has already occurred in some parts of the privatised system.

Railtrack's 1998 Network Management Statement (NMS) argues that, whereas Railtrack shares with the Government and the Train Operating Companies the objective of traffic growth, access charges have been structured in a way that gives Railtrack a very low share of underlying growth. (*Modern Railways*, May 1998, 312) Railtrack has actively sought funds for improvement from the operating companies, as well as from English, Welsh and Scottish, the operator responsible for railfreight.

However, such funds may come at a price. For example, Virgin Rail's plans to introduce tilting trains on the West Coast mainline require substantial and costly track upgrading. Railtrack has sought contributions from Virgin which, in turn, has agreed to contribute providing that the Rail Regulator agree to moderate competition on the route until the end of its 15-year franchise. Under current plans, this would give Virgin eight years of effective monopoly power over the upgraded route.

This appears to be a case of a poor incentive structure leading to undesirable outcomes.

An important aspect of industry structure concerns the relationship of rail with other modes of transport. In particular, road freight operators may wish to become involved in train operation or even operation of entire rail systems. There could be some economies through the integration of road and rail, which are often complementary rather than substitute modes. However, road is the main competitor for many of the routes and traffics of the rail systems. Mergers between road and rail could result in markets with very few competitors, and considerably more market power than either road or rail possessed before.

Competition

Competition is only feasible in Australia at the operating level: competition on a route basis is rarely feasible. Since freight and passenger flows are limited or 'thin' in Australia, alternative traffic paths are rarely available. For example, whilst there may be several alternative routes between major cities in Europe, Japan or North America, there is only one practical rail link between Sydney and Melbourne. To achieve competition, access price regulation is necessary. If there were a single, vertically integrated rail system operating across Australia, it would possess a monopoly and it would not be in its interests to permit competition. If there are vertically integrated, regionally based monopolies (state based rail systems) competition would not emerge, since systems would need each other's facilities in order to provide intersystem products. They would provide these products, especially if they were private profit oriented firms, but not on a competitive basis. If there is vertical separation of track from operations, there will be no effective competition at the train operations level, regardless of whether there is horizontal separation or not. Unregulated track monopolies will simply use their market power at the track level to dominate the final product market.

Competition is desirable in order to promote productive efficiency in the provision of train operations, to encourage product diversity and integration, to promote efficient investment in train operations, and to promote efficient price/quantity decisions. The downside of competition is that it necessitates access price regulation and this regulation imposes costs. As discussed above, such regulation creates an incentive to underinvest in track infrastructure, and it creates incentives to downgrade quality. Thus there is a trade off between the benefits of competition and the costs of regulation.

This trade off differs according to the vertical structure of the industry, and according to whether there is public or private ownership. If the industry is vertically integrated,

it is likely that there will be a lower cost of access price regulation, but competition will be less intense. A vertically integrated firm will be a strong competitor, and it may be difficult for other firms to compete with it even when access price regulation is quite favourable to them. If the benefits from competition are limited, vertical integration and less competition will be desirable. If the costs of access regulation are low, vertical separation becomes an attractive option because it will be more effective in promoting competition.

The merits of competition will be greater under public than under private ownership. The downside of private ownership is the use of market power, but in the case of rail this aspect of inefficiency is likely to be less important than other aspects, for which public ownership performs poorly. Thus competition at the train operations level will produce greater benefits under public than private ownership; if the costs of access regulation are similar, there will be a stronger case for access regulation under public ownership. This is perhaps the reverse of what is normally suggested, i.e. regulation is more needed under private than public ownership. This is, however, to control the use of market power, which is of limited importance in the present context.

Regulation

As has been argued above, the case for regulation depends on the form of ownership and the industry structure. Indeed, the case for access price regulation is very much the case for competition. An alternative form of regulation is final product regulation.

In general there is not much of a market power problem in rail. In the early years of rail, public ownership was adopted in Australia partly as a means of controlling rail's market power. Since then, its competitors - especially road transport - have become much more effective, to a point that rail no longer has significant market power in many markets. There remain some markets in which rail has market power; in particular mineral traffic markets for which road is not an effective competitor. Rail tends to charge what the market will bear when carrying minerals. This practice has some efficiency costs, even though it is often argued that no mines are lost because of rail pricing, the intensity of mining may be reduced and mines may extract less than is socially optimal. Rail freights may form part of inefficient rent seeking games between governments. Regulation of rail freights has the scope to produce large changes in the share of mineral rents, although it is doubtful if that would lead to large efficiency gains.

Another type of market in which rail may possess market power is in passenger traffic to regional centres. These are likely to be thin markets, and there may not be effective competitors. Rail may have the scope to charge high prices. While this is a possibility, it is more likely that even monopoly prices will fail to cover costs, and that it the traffics are to be served, subsidies will be needed.

If access regulation is imposed, it is desirable that it be imposed on a national rather than a state basis. Just as horizontal separation will add to costs of journeys which cross systems, separate access regulation will add to such costs. Separate

regulation will be different regulation, and an operator will need to negotiate access to track in several different, perhaps conflicting, regulatory environments. Already the differences in access regimes is proving a practical barrier to operation of interstate train operations. While there may be differences in track costs in different states, due to such factors as terrain, which may justify different prices, it is desirable to keep access arrangements as simple and comparable as possible.

6. The Role of Government

The government may have a role in the rail industry as a regulator, and as an organiser or funder of community service obligations.

Regulation

The rail sector may well be regulated; most likely there will be some sort of access regulation. There should be a clear preference for nationwide regulation, especially of the interconnecting systems. At present there are many regulators, and the environment is far from satisfactory. One of the key aspects of efficiency is for there to be the provision of cross border services which customers are willing to pay for. Under present arrangements, it is difficult for new firms to enter and provide this type of services. In addition to the normal resistance from incumbents, entrants have large transactions costs in dealing with different and contradictory access regimes. The aim should be an access regime in which it is simple for entrants to offer services provided they are prepared to pay the set access charges. A national access regime need not have the same price for access to all parts of the national track network; different circumstances call for different prices.

The principles of access pricing need not be discussed in detail here. Access prices should be forward looking in the sense that they are sufficient to cover the costs of further investment in the track, for example to replace or upgrade the track. There may be exceptions to this rule, where a track would not be replaced when it is no longer usable; in such cases, prices set at or close to marginal cost may be warranted. Quality of service is an important aspect, often given too little attention by regulators. With rail track, service quality can be improved (e.g. allowing trains to travel at higher speeds) if there is more investment (maintenance costs may change as well). Access prices will need to be set at a sufficient level to cover the costs of investment as is warranted in upgrading quality.

This poses an important question for the regulatory framework- who decides on investment levels and service quality. It is now being increasingly recognised that price regulation, and price-caps in particular pose major problems for investment and quality; regulated firms tend to underinvest and underprovide quality. The regulator can offer higher price-caps in return for higher investment or quality, but someone must make the decision as to the right level to provide. Ideally, the user and provider of the service should decide this, but the price-cap breaks the nexus between these two. The regulator needs to step in, even though it does not have the same information on the costs of quality as the provider, or the same information on the willingness to pay for quality as the users. Overseas, regulators have become

deeply involved in investment assessment and quality determination, even though they possess limited information. They are unable to perform these tasks perfectly, and this amounts to a significant cost associated with regulation.

How extensively should we regulate access? Certainly, access regulation should cover the main interconnecting systems. However, where systems are not connected, the desirability for uniformity is much less. Different access regimes could apply in Tasmania than in Queensland without great efficiency loss. There is no strong case, on efficiency grounds, for the application of an access regime to remote mineral railways. While disputes between track owners and potential users may develop (and already have developed), regulation is not really necessary. Essentially, all it does is affect the share of mineral rents which go to the rail owner and mine owner. Independent negotiation between parties should result in efficient decisions (though track owners will do better in the unregulated environment).

Community Service Obligations

Where and when subsidies are granted for specific services is essentially a political decision. Currently several services operate at a loss. Rail reform will upset the cross subsidy patterns which exist (and is doing so already). A move towards private ownership or strong corporatisation will result in firms which are not prepared to tolerate loss making services. Access price regulation will make cross subsidisation unworkable, unless access prices are set very high. Currently some rail services, such as those carrying coal, are priced above costs. If access is granted at rates which cover the cost of provision of track services, but not above, current prices will be unsustainable; the only way existing systems will be able to keep their traffic will be through lowering prices to cost. Hence there will be a problem of funding subsidies once rail reform is in place.

There are several options which need not be discussed here. One is for direct funding from government budgets; this is transparent, though expensive, since government revenue is expensive to raise. Cross subsidies may well be better on efficiency grounds, in that they may involve smaller distortion costs; they do have the problem that they are inconsistent with competition. Governments could impose industry specific levies, at the access or the final product levels, to fund subsidies. The attractiveness of this option is less if there are already in place general taxes which are levied on rail outputs. This would be the case if a goods and services tax were levied on rail services, as seems quite possible.

7. Rail Reform in Perspective

Rail reform is not an easy task. The starting point is not ideal; in spite of recent progress, there are many features of the current institutional environment which are unsatisfactory, notably the lack of cooperation between systems, and removing these will not be easy. Some options will not appeal to some governments, and this will slow change in the systems as a whole. Progress in terms of one option, such as privatisation, will have implications for progress in others, such as horizontal

integration, since different ownership structures and firm objectives will make coordination difficult. It is not a matter of moving rapidly to a preferred environment.

Rail reform overseas has had mixed success, and there are lessons to be learnt for Australian reform. In the US, reform proceeded smoothly, and results have been good. The US has vertically integrated private railways, which compete with road, and to an extent with each other, since markets and networks are dense. Reform consisted of deregulation which removed price and related controls. Use of market power does not seem to have been much of a problem. Reform in the UK has been much more controversial. Both vertical and horizontal separation have created problems. There are problems of coordination between companies, and there are problems of service quality and investment which arise because the separated track, rolling stock and operating companies have not faced clear signals for efficient investment.

Reform in the rail sector does involve considerable uncertainties; it is not possible to know in advance which environment will be most conducive to good performance, and it is not clear how certain options will work. For example, there are considerable uncertainties surrounding:

a) the relative merits of vertical integration and separation;
b) the effectiveness of competition under access arrangements, with and without vertical integration;
c) the effects of access price regulation on investment and quality of service; and
d) how effectively different regionally based systems will cooperate with each other under different environments.

These uncertainties condition suggest caution in recommending preferred options. There may be merits in diversity, with one state choosing one approach and another choosing a different one. Over time, this may shed light on which approach is better. Whichever package of reforms is adopted, it will probably be necessary to alter the package in years to come, to remove the unintended adverse consequences of the reforms.

In Table 2 we list the various options that have been discussed here, and attempt to give an overall evaluation of them. One point we stress is that the merits of one option will depend on the choices made about other options; hence the interrelationships between options must be highlighted.

Table 2: Assessment of Reform Options

Reform	General Assessment	Implications of Other Reforms
Private Ownership/ Corporatisation	The more the better	Better if effective Access Better if effective CSO Regime
Horizontal Separation	The less the better	Less a problem if private ownership Less a problem if National Access Regime
Vertical Separation	Mixed	Useless without effective Access Can make Access Regulation difficult Facilitates Road-Rail Integration
Road-Rail Separation	Full separation rarely needed Undesirable	Less needed if Rail Vertically separated Less if effective Access Regime Redundant if effective Access regime
Final Product Regulation	Probably desirable	More needed if public ownership
Access Regulation		More needed if Road-Rail Integration More efficient with Vertical Integration
CSO Subsidies	Political Decision	Access Pricing undermines cross-subsidies Private ownership makes cross-subsidies unlikely

The first option we consider is a move towards private ownership, either privatisation or a stronger form of corporatisation. Our general assessment of this is favourable; it will have positive effects on most aspects of efficiency, and the aspect of efficiency on which it has negative effects is not very important in the rail context. Use of market power is not too much of a problem. Private ownership will necessitate attention being given to how CSOs are to be provided, and it will work better if an efficient access regime is in place.

In contrast, horizontal separation has little to offer. It creates problems of inter-system coordination; these will be less if there is private ownership, since the profit orientation of private firms will induce them to make coordination work. A nationally consistent access regime can help service coordination, especially when there are

independent systems which are oriented to different, non profit objectives, and which have weak incentives to cooperate with each other.

Our verdict on vertical separation is mixed. Separation of track from operations can enable more effective competition at the operations level. The downside is that economies of integration will be lost, and access regulation will become more difficult, in that the regulated firm has less of an incentive than under vertical integration to provide the right service quality level, and to invest efficiently. There would be little point in vertically separating a system and then not imposing an access price regulatory regime, since there would be no reduction in market power- all that would happen would be that it would be concentrated in the hands of the track provider. Another consideration is the scope for road-rail integration. Under vertical integration with a dominant integrated firm, at the regional or even the national level, allowing integration between freight forwarders and rail systems could dramatically reduce competition, whereas in a vertically separated environment with several train operators, it might not matter if some of these were owned by road operators.

Integration between road and rail depends on how much competition there is at the train operations level. If there is strong competition, perhaps facilitated by an efficient access regime, then there will be advantages in allowing road operators to also operate trains; no doubt there will be some economies of integration.

Price regulation of the final product is unlikely to be desirable. It can limit the use of market power, but this is not likely to be a major concern. The purpose of access price regulation is more to stimulate competition at the above track level, rather than control the use of market power. If there is to be regulation, access regulation can achieve more at no greater cost.

Access regulation is probably desirable, though it does have its costs. In particular there is a concern that a practical price regulatory regime will create incentives for undersupply of quality, and it will pose problems for ensuring sufficient investment. Access regulation and competition are closely related, and hence if there is a public firm which is not performing efficiently, there will be a stronger case for forcing it to perform by increasing the competitive pressure on it; this can be done through access regulation. If it is considered that there are large gains to be made through better integration of road and rail, the case for access regulation, and hence competition in train operation will be stronger. Access regulation will be less effective, but also less costly, when there is vertical integration.

Finally, whether subsidies are provided for CSOs is a political decision, but the reforms undertaken will have an impact on how these subsidies are funded. Several reforms such as access regulation will undermine cross-subsidies which are in place, necessitating an alternative form of funding.

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Note: Some references are not directly referred to in text.