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RAIL REFORM STRATEGIES: THE AUSTRALIAN EXPERIENCE

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ABSTRACT

Widely different approaches to rail reform are evident across countries and within Australia. Reforms have involved structural separation (both vertical and horizontal) and varying degrees of private sector involvement.

Evidence from Australian experience suggests that no one size fits all. The characteristics of rail networks - namely the degree of market power, the strength of intermodel competition, competition in downstream markets and traffic density would all influence the approach adopted. These differ for urban passenger, regional freight (general and bulk) and long distance networks. The potential implications for future rail reform are outlined.

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I Introduction[1]

Railways began operating in Australia in the 1850s and, in many ways, they transformed transport in the country. They became vital links between Australia's cities and ports and the rural hinterland, facilitated export expansion and were used by governments to pursue social and political objectives (PC 1999).

However, much has changed since those early days. As more air, land and sea transport options have developed, so the role of rail has changed. Although railways in Australia still play a significant role in the intrastate transport of bulk commodities and general freight along major corridors, and in urban transport, they are not as successful in other areas. Changing modal shares with the decline of rail in part reflect inherent advantages of other transport modes, particularly technological improvements. However, there have also been concerns that the poor performance of rail contributed to its own decline. Indeed, one Australian State government told the Productivity Commission (PC) during its 1999 inquiry into rail reform in Australia that a lack of rail (and maritime) productivity has resulted in an over-reliance on air and road transport in Australia (PC 1999, 1).

Concerns about the performance of rail led to a number of railway reforms and inquiries into the industry in the 1990s. However, it is not just in Australia that reforms have occurred. Railways in many countries have undergone significant changes in aspects of their organisational structure, ownership and access arrangements over this period. Widely differing approaches to rail reform are

evident, both across countries (discussed briefly below) and in different jurisdictions in Australia (the focus of this paper).

Reforms have included structural separation (both vertical and horizontal), the introduction of commercial disciplines (corporatisation and privatisation) and arrangements for third party access to track infrastructure.

The wide range of reforms being implemented raises the question of whether one approach is superior to another. Using Australian railways as an example, this paper argues that because rail networks differ in terms of their economic characteristics and the challenges they face, it is important that individual reform packages be tailored to each network.

II International reforms[2]

During the 1990s, reforms in some countries, such as Great Britain (England, Scotland and Wales), New Zealand and Argentina, involved increased private sector participation. In Great Britain, for example, 25 passenger service operations were established under franchising arrangements and the track, signals and stations were sold to the private sector.[3] Structural reform across these countries has involved different combinations of vertical and horizontal separation (box 1).

Other countries have adopted reforms that change structures within government-owned railways. For instance, in 1994 the publicly-owned Netherlands railways was separated vertically into track infrastructure and train operations, with the latter divided into four commercial business units (passenger,

freight, stations, real estate). Some new private entrants have also entered the Dutch market.

Table 1 provides an overview of the structure and ownership of the railways in selected countries[4].

Many teething problems have been associated with these reforms. A notable example has been Great Britain. An apparent deterioration of services and major safety problems — as evident from several rail crashes in the 1990s, as well as the Hatfield rail crash in October 2000 — led to experts blaming the fragmentation of the system. One transport specialist suggested that the complex structures created by privatisation generated some problems, particularly relating to lines of accountability (Grayling 2000). Others have noted problems such as the setting of inappropriate benchmarks, shortcomings in liability regimes and weak investment incentives (*The Economist*, 3 July 1999, 57–60; Trace 1999).

III Australian reforms[5]

The development of railways in Australia since the 1850s reflects the fact that Australia is a federation of states. There is a national (Commonwealth) government and eight State and Territory governments[6].

Historically, railways have been (and many are today) under the jurisdiction of State governments. At the start of the 1990s the Australian rail system was characterised by integrated (State-owned) railways providing passenger and freight services in their respective jurisdictions.

Australian National (AN) railways (owned by the Commonwealth government) provided long distance passenger services on the mainland, freight services across jurisdictions and intrastate freight services in South Australia and Tasmania.

The State systems accounted for most rail freight transported. Of the more than 66 billion net-tonne kilometres of rail freight transported in 1996-97, for example, about three-quarters were accounted for by State railways. Queensland was the largest individual freight carrier, transporting about 43 per cent of the total in that year. The busiest routes (in terms of net-tonne kilometres) tended to be along the North–South corridor, that is, between Melbourne and Sydney and between Brisbane and Melbourne. However, rail had the most significant *share* of freight transport on the route between Perth and Adelaide (IC 1991).

One of the legacies of the historical pattern of development of the railways was a degree of parochialism, resulting in a lack of standardisation of rail gauges. Standardisation of the interstate network was only completed in 1995 when the Melbourne to Adelaide broad gauge route was converted to standard gauge.

A number of factors drove reform in Australian railways in the 1990s. These included:

- increasing pressure on government budgets to finance railway deficits, subsidies and investment (the total amount of explicit subsidies paid to railways by State governments in 1997-98, for example, exceeded A$2.3 billion, representing 4 to 5 per cent of the outlays of some governments

(PC 1999, 263). In 1996-97, the rail deficit was A$1.36 billion (HORSCCTMR 1998, 110), and total Commonwealth, State and local government investment in rail was about A$1.6 billion (HORSCCTMR 1998, 112);

- pressure on railway freight rates arising from increasing intermodal competition (this increased competition was due to the removal of the legislated monopoly previously given to rail for the carriage of certain bulk commodities,[7] and improvements in road transport technology and infrastructure);
- pressure on railway freight rates from increasing competition in downstream markets for some commodities; and
- the introduction of a National Competition Policy[8].

A wide range of different structural, ownership and access arrangements was introduced by the states in the 1990s (table 2). Queensland has retained a single, government-owned railway that provides freight and passenger services and maintains rollingstock and track infrastructure. This entity was, however, corporatised in 1995-96. New South Wales (NSW), on the other hand, structurally separated its State Rail Authority in 1996, initially into four government-owned businesses (with responsibility for urban and non-urban passenger services; freight; track infrastructure; and track maintenance), of which three were corporatised.

In other states reforms have led to greater participation by the private sector through franchising of urban and non-urban passenger rail services (Victoria) and privatisation of freight operations (Victoria, Western Australia). The Commonwealth government privatised parts of the Australian National (AN) railways and has plans to sell the National Rail Corporation (NRC), which assumed responsibility for AN's interstate freight operations in 1993. The interstate track was transferred to a new Federal authority, the Australian Rail Track Corporation (ARTC) in 1998. On the East-West Corridor across Australia, private operators now compete directly with the government operator in niche markets[9]. Overall the number of private railways rose from 6 in 1991 to 19 in 1999.

As with the experience overseas, these reforms have not been without problems. In particular, similar problems to Great Britain seem to have arisen following structural reforms in NSW, where a series of rail accidents and concerns over track maintenance standards resulted in an inquiry into the safety of the network. This safety audit, released in April 2000, noted that poor co-ordination among the new government-owned rail agencies had impeded the system's safety performance, and that a cultural change was required to allow the "effective delivery" of safety initiatives (Humphries 2000). In 2001, the businesses responsible for track access (Rail Access Corporation) and maintenance (Rail Services Australia) were merged into a single entity, the Rail Infrastructure Corporation, subject to direction from the NSW Transport Minister.

Until recently attempts to privatise the NRC and the NSW Freight Rail Corporation (FreightCorp) had stalled. The sale of NRC was complicated by the fact that three governments — the Commonwealth, New South Wales and Victoria — had joint ownership of the Corporation.[10] Disputes over access to Victorian terminals and tracks initially delayed privatisation (Skulley 1999). These issues were resolved in 1999. In NSW, the Labor Government faced opposition (particularly within its own party) to a proposal, made in September 2000, to privatise FreightCorp in parallel with the NRC. Concerns mainly related to job losses and the possible impact of the sale on the regions. The NSW Government eventually received support for the privatisation proposal from an Upper House Committee of Parliament and a Country Labor Party Conference.[11]

The Commonwealth and relevant State Governments have now agreed to link the two businesses before selling them by the end of 2001. It is intended that the merged entity would have two divisions – a bulk haulage arm (FreightCorp's business) and an intermodal arm for NRC's interstate freight services. However concerns have been expressed that the twin sale could substantially lessen competition, with the merged entity holding a high proportion of standard gauge rollingstock. The Governments have indicated that any competition issues raised by the Australian Competition and Consumer Commission would be addressed through the sale process (Batchelor, Fahey, Anderson and Egan, Joint Media Release, *Combined Sale of National Rail and FreightCorp under way*, 24 August 2001).[12]

IV Performance of Australia's railways

Reforms in the 1990s transformed the structure and operations of Australia's railways. There is now greater competition between railways and more private sector participation in some corridors. The Productivity Commission (PC 1999) found that there were significant improvements in the productivity of (government-owned) railways providing freight and passenger services over the period 1989-90 to 1997-98.

Figure 1 indicates that the average annual growth in (total factor) productivity of Australia's railways of around 8 per cent was greater than that of Canada, Japan and the United States.

Freight customers benefited from this improvement in productivity. Real freight rates fell 30 per cent between 1990 and 1998. This is comparable with decreases in Canada (33 per cent) and US (26 per cent) between 1990 and 1997.

However, while Australia has narrowed the gap in productivity, there remains a significant difference. Australia's level of productivity in 1998 was about two thirds of the best performing countries (in 1997).

Some of the difference is due to factors that inherently disadvantage Australia, such as scale of operation. However, technical efficiency (productivity adjusted for the effect of scale) remains 30 per cent below the best performing countries.

V Future reforms

As discussed in section IV, improvements in the productivity of Australian railways had occurred in the 1990s but there was room for further improvement. Reforms during the decade had contributed to the improved performance but the Productivity Commission Inquiry report (PC 1999) considered that more needed to be done to ensure further productivity gains in Australia. It argued that a greater commercial focus and the harnessing of competitive forces were the keys to ensuring further productivity gains. Numerous participants to the inquiry agreed with this view.

While steps had been taken to corporatise the remaining government-owned railways, the ongoing problems for these railways appear to reflect the way the corporatisation model has been implemented. Corporatisation aims to provide a public enterprise with similar objectives, incentives and sanctions as a private sector firm (Hilmer, Rayner and Taperell 1993, 300). The Hilmer Report noted five basic principles for the effective implementation of corporatisation. These were clarity and consistency of objectives, management authority, performance monitoring, effective rewards and sanctions, and competitive neutrality.[13]

However, governments still subject their rail operators to multiple, often conflicting objectives relating to social welfare, regional development and employment. Governments as shareholders face budget constraints and are often reluctant to provide equity funding or allow railways to borrow on their own behalf, even if justified commercially. Further, governments are often reluctant to

maintain an arm's length relationship with their railway boards because of political and community pressures.

Even in theory, limitations apply to the corporatisation model. In particular, public ownership subjects governments and taxpayers to considerable commercial risks.

Thus private sector alternatives to government provision have an important role to play in overcoming these problems. These alternatives can include contracting out and franchising. Competitive tendering and contracting (CTC) allows the introduction of competition into the provision of certain services and has been used increasingly by Australian railways, particularly in areas such as maintenance. Competition is introduced through the bidding process and so encourages providers to adopt efficient service delivery methods. The main benefits of CTC are seen to include lower costs, improved service, and greater flexibility (King 1994). However, contract specification is an important determinant of the success of CTC. As well as specifying price, contracts need to contain incentives or conditions to maintain service quality.

Franchising involves the government granting a franchisee the right to operate a service for a fixed period. It can generate further gains because franchisees bear revenue risks, so strengthening their incentives to improve service quality and expand the size of the market.

Full privatisation can, in theory, offer a number of benefits over public ownership. Privately-owned firms are said to have greater incentives and ability

than public enterprises to be cost-efficient, make productive investments, be innovative and customer focused (see for example, Asterisis 1994). Privatisation thus provides opportunities to change the leadership and culture of rail enterprises and transfer risk fully to the private sector.

In Australia, the Tasmanian rail system and interstate non-urban passenger systems have been privatised. The experience of privatisation with these systems is encouraging and supports privatising freight railways operating in competitive markets such as NRC and NSW's FreightCorp.[14] Scrafton (2001) has argued that "new entrants in both freight and urban passenger railways are showing signs of turning around formerly declining markets, with commitments to investment, new services and courageous targets". For example, since purchasing Tasrail in 1997, the private owners have increased traffic volumes significantly, winning major contracts to haul logs and containers. Tasrail's revenue increased, while costs fell, making the railway profitable for the first time in 130 years. The private owners have invested heavily in new sleepers, communications systems and replacing the ageing rollingstock. Likewise, some interstate passenger routes began to generate positive margins following privatisation (PC 1999).

Competition can improve peformance further. There are a number of forms competition can take — both 'in' the market and 'for' the market. Much of the rail network is already subject to intermodal competition from road, air or coastal shipping, and/or competition in downstream markets. The different forms of competition are summarised in Box 2.

Competition can be facilitated by structural reform (eg vertical or horizontal separation — box 1) and the introduction of regulatory arrangements to enable access to track infrastructure. However no single structure or access regime is appropriate for all networks.

VI Decision making framework

So how do governments decide which approach is appropriate in reforming their rail networks? The specification of objectives and examining the characteristics of the rail network can help in the decision making process. Taking these steps allows identification of the forms of competition and structural reform that may be appropriate in each market.

Specifying the objectives of reform at the outset helps to identify the rationale for reform, and hence provides guidance on how to best implement reform (and, indeed, helps to identify if reform is needed at all). For instance, the overarching objective of reform may be to have an efficient transport system meeting the freight and transport needs of a country, not to raise revenue from the private sector or to increase the aggregate level of service from railways. This implies that the extent to which each transport mode is used in the transport system would depend on its economic merit. Railways simultaneously compete with, and complement, other modes in providing a seamless transport service.

The efficient operation of railways is an important contributor to an efficient transport system. The sources of improved efficiency in railways — as in other industries — are static and dynamic efficiency gains. Static gains are achieved

through one-off improvements to eliminate the sources of x-inefficiency. This can involve making better use of existing labour, equipment and infrastructure. Dynamic efficiency gains involve continual improvement through innovation and, in the case of rail, continually optimising its position in the transport logistics chain.

In most instances rail reform packages implemented across countries have delivered static efficiency gains. In New Zealand, for example, there were significant improvements in labour productivity, asset utilisation, traffic levels and profit in the five years following privatisation (PC 1999, 149). To some extent these are the 'easy' gains. But dynamic efficiency is likely to be more important to rail in the long run. Achieving greater dynamic efficiency is more difficult as it is likely to involve fundamental changes to the culture and operations of railways.

It is also important to understand the differing economic characteristics of individual rail networks. In a few markets, such as the transportation of bulk commodities such as coal, railways are able to exercise market power and extract monopoly rents from users. For other freight operations, railways may generate just sufficient earnings to be commercially viable and support future investment. Urban passenger rail services tend to be loss making and rely on government subsidies for survival.

In addition, network interface issues, which occur when a train from one network needs access to another network, can potentially impede the efficiency of train operations and influence the appropriateness of different policy options. The

extent of interface issues will depend on several factors, including the number of trains from other networks seeking access, the complexity of the network, and the level of traffic density.

Having identified objectives and network characteristics, the forms of competition likely to be effective in each network can be identified. Competition 'for' the market, as occurs with franchising, is typically suited to natural monopoly situations where it is most cost effective to have only one provider of the rail service. In other markets, it may be possible to have multiple train operators competing for the same customers, that is competition 'in' the market (for example, long distance rail lines). This can encourage market segmentation and product diversity. In other markets, intermodal competition or competition in downstream markets may be sufficient to promote operational efficiency.

Finally, the emphasis in rail reform on promoting various types of competition is underpinned by structural reform. In essence structural reform involves breaking up established railways into separate entities, with separation occurring on a geographic, functional (track, rollingstock, maintenance), and/or product (passenger or freight) basis.

The potential benefits of structural separation may include the promotion of competition, facilitation of the regulation of natural monopoly elements of the track, and the implementation of appropriate policies in different markets (PC 1999).

Separating train operations from the track (vertical separation) is designed to facilitate competition between train operators for the same customers and competition for train schedules. But vertical separation may not be effective in markets where there is limited scope for more than one operator or there is already effective competition from other modes of transport and/or competition in downstream markets (OECD 1999). It may also result in coordination and safety problems.

Separating railways by function or geography (horizontal separation) can improve the effectiveness of policies and regulatory regimes relating to different rail businesses. Contractual arrangements to meet non-commercial objectives (social, regional or environmental) can also be implemented more readily. It also enables services to be franchised in order to introduce competition 'for' the market through periodic competitive bidding.

The potential benefits of structural separation need to be balanced against the costs. The costs of structural separation potentially can include loss of economies of scope, interface problems between networks, loss of commercial sustainability, adverse effects on safety and adjustment costs.[15]

VII Applying the decision making framework

The PC inquiry report into progress in rail reform (PC 1999) applied this decision making framework to the Australian railway system. Based on their economic characteristics, four different types of rail network can be identified in Australia — urban passenger, regional, main coal lines and the interstate network.

For each network the problems to be addressed and the impediments to improved performance differ, requiring differing policy solutions.

Urban rail passenger networks

Urban rail passenger networks exist in the mainland state capital cities of Sydney, Melbourne, Brisbane, Perth and Adelaide. These networks are non-commercial and only exist in their current form because of continued government support. In the markets served by these networks there is strong intermodal competition from private motor vehicles and from alternative public transport modes in some instances. There is no rail on rail competition.

Urban rail passenger networks pose a variety of challenges to governments and their operators. These railways are often criticised for their deficiencies in productive efficiency, large financial deficits and poor service quality. These problems are further compounded by the fact that urban rail passenger services are highly visible to the public, often in need of capital investment and subject to industrial disputes.

Given the loss making nature of these networks, governments ultimately decide which services will be provided and the contribution users make towards the cost of provision. The performance of the urban transport system can be improved by ensuring that urban rail services fulfil an appropriate role within the system (improving allocative efficiency) and then that those services are provided at least cost to taxpayers (improving operational efficiency).

Allocative efficiency can be improved through the rigorous application of the purchaser-provider framework. The purchaser-provider framework separates the responsibility for deciding which goods and services are provided to the community from the responsibility for delivering the services (PC 1999). Governments consider and decide on the choice and mix of transport services purchased to promote stated objectives, rather than leaving such decisions to railway management.[16]

Greater operational efficiency can be encouraged by generating competition for the market through contracting or franchising. This approach is preferred to promoting competition between train operators. Urban rail passenger services require that trains run frequently and to a complex timetable. Coordination of services to meet the timetable is likely to be more effectively undertaken by one operator. In addition, the relatively small size of many urban passenger networks in Australia limits the scope for competition between train operators for the same customers.

Vertical integration can facilitate the franchising process and operational efficiency of urban passenger networks Vertical separation is not warranted because there are no benefits to be obtained (through competition between train operators) to offset the costs of separation. In addition, accountability is also likely to be weakened in such a structure. If service standards are not achieved or if accidents occur, a regulator will be required to apportion responsibility and impose

sanctions. As noted by Kain (1998), apportioning blame for poor performance may require considerable information and administration on the part of the regulator.

Horizontal separation of urban rail passenger networks from other rail networks can facilitate the application of the purchaser-provider framework by clearly delineating those services requiring government support from other commercial rail operations and networks. In addition, it may be worthwhile to horizontally separate the networks further into two or more geographically based franchises to promote 'yardstick' competition, provided the population size is sufficient to support such separation.[17]

The benefits of further horizontal separation need to be balanced against potential interface and coordination issues that may occur between operators over shared segments of the network.[18] It has been argued, including by participants to the PC's inquiry into rail reform (PC 1999), that in some instances the horizontal separation of urban rail passenger networks from other rail networks is impracticable due to the interface issues between them. However, there are examples both in Australia and overseas of contractual arrangements being used to overcome such problems. In Victoria, there are contractual arrangements between an urban passenger operator in Melbourne, M-Train (formerly Bayside Trains), and interstate and regional operators that allow the use of the urban network by non-urban and freight trains. Similar arrangements also apply in the United States (PC 1999,110 and E24). The balance of evidence indicates that the benefits that

can be obtained from horizontally separating urban rail passenger networks outweigh the cost of such contractual arrangements.

Regional networks

Regional networks in Australia refer to those rail lines that extend from the ports and capital cities into the regional areas as well as lines from regional areas that connect into the interstate network. Within the regional networks of New South Wales and Queensland are the main coal lines that are discussed separately below. The services provided by regional networks are dominated by the transport of general freight and grains. The financial performance of these networks is mixed. Some networks have been able to generate sufficient revenues to earn a commercial return, while others are reliant on government support. In virtually all instances, the freight carried on regional networks is subject to strong intermodal competition, especially from road.

The poorly performing regional networks are confronted with the problems of declining market shares, increasing financial deficits and a running down of existing infrastructure. These problems have arisen primarily due to these railways' inability to meet new competitive challenges, especially from road transport. This stems mainly from government involvement. In many instances, governments have required railways to pursue a range of conflicting objectives, interfered with their day-to-day operations and restricted their access to capital. This has reduced the ability of these railways to meet customer needs at competitive prices, which is further compounded by the continual running down of

the infrastructure base. At the same time, governments have deregulated freight carried by road, exposing rail to increasing competition.

Regional networks in Australia need to achieve both static and dynamic efficiency gains if they are to survive in the competitive transport markets in which they operate.

As the impediments to improved performance primarily stem from government involvement, the most effective way of overcoming them is to increase the commercial focus of regional networks. This requires that railway managers have the flexibility to make timely decisions, the ability to form strategic alliances, to access capital, and not face undue restrictions on input choice.

The commercial focus of government-owned railways can be improved through corporatisation. However, as noted earlier, there are often limitations on how well the corporatisation model is applied. In particular, governments are often unable to maintain an arm's length relationship from their railway boards because of political and community pressure.

The limitations of government ownership can be overcome through greater private sector participation by either franchising or full privatisation. Privatisation of rollingstock and a long-term lease on infrastructure are preferred to franchising in this case because it allows for greater commercial focus and increased flexibility.

Alternatively, the performance of regional railways could be improved by encouraging competition between train operators through vertical separation

combined with access arrangements. However, the small volumes of freight carried on regional networks, and the resulting inability to achieve economies of scale, suggest that profitable entry by third party operators is likely to be limited in most instances. Importantly, as already noted, there is competition from other transport modes, which would encourage improved performance by the incumbent operator. The impediments to improved performance are not a lack of competition but rather an inability to meet existing competitive challenges.

Thus vertical integration appears to be appropriate for regional railways, since vertical separation makes little, if any, contribution to overcoming the main impediments to improved performance.

Regional networks are also particularly suited to horizontal separation. This would clearly delineate those markets where direct government involvement is not required. Rail management would have the freedom to focus on developing new market opportunities and increase operational efficiency. 'Light handed' access arrangements can be tailored to ensure that non-competing trains from other networks can gain fair and reasonable access. However, it is expected that access would not be an issue because owners would have incentives to provide access to non-competing trains as the increased traffic flow can increase profits to the track owner or lessee.

Main coal lines

The main coal lines in Australia are defined as the Hunter Valley coal network in New South Wales and those lines centred on the Goonyella and South

Blackwater regions in Queensland. These networks carry high volumes, are highly profitable and have a natural monopoly in the carriage of almost all coal in these regions (that is, there is little competition from road or rail-on-rail competition).

Unlike other rail networks in Australia, the main coal lines have maintained their market share in the transport of coal and investment has been easily justified on a strictly commercial basis. In this instance, the problems associated with the main coal lines are those of market power and the extraction of monopoly rents from mining companies, as well as inefficient operations.

There are two main reform packages the state governments could implement to control the existence of market power on the main coal lines. First, competition between train operators could be encouraged, with monopoly pricing of the track infrastructure addressed through access regulation. Alternatively, franchising of a vertically integrated network may be used to promote competition 'for' the market by awarding contracts for the right to supply rail services (track and train). Tenders could be awarded on the basis of the lowest total cost of service provision over a relevant period. Track and rollingstock could be leased to the franchisee and access conditions incorporated into franchise agreements.

The appeal of the first approach is that competition between train operators can control monopoly pricing on the part of operators, while vertical separation can increase the transparency of access price regulation. However, there are some practical problems with this approach. In the first instance, sunk costs associated with investing in locomotives and wagons can act as a substantial barrier to entry

to potential new entrants. This problem is compounded by the fact that the rollingstock used to haul coal is specific to the haulage of bulk commodities (especially the wagons), reducing its transferability to other rail markets.

In addition, even if effective competition between train operators could be achieved, the issue of monopoly pricing still exists in track infrastructure. The control of such monopoly power requires complex regulation.

Franchising has the advantages that the bidding process can be designed to facilitate the transfer of assets (especially the rollingstock), removing a substantial barrier to entry and making the market more contestable (OECD 1999). The franchisee has commercial incentives to obtain dynamic efficiencies and lower costs by improving the role of railways in the transport logistics chain between the mines and port(s). In addition, franchising reduces the need for prescriptive access regulation. Periodic retendering and awarding contracts on the basis of the lowest freight rate can help to reduce monopoly rents (PC 1999).

However, franchising is not a perfect or costless solution to controlling monopoly pricing. The OECD (1999) identified three potential difficulties with the franchising of rail services, including: the possibility of uncompetitive bidding when there are insufficient bidders; the difficulties of choosing between bids that offer different packages; and the specification and administration of contracts.

On balance, the economic characteristics of the main coal lines suggest that a process of franchising through competitive tendering is likely to be superior to facilitating rail-on-rail competition. Government involvement continues under

both approaches through access regulation or the franchise process and agreements. However, it is less certain that vertical separation and access regulation will lead to new operators entering the market owing to the sunk costs associated with the rollingstock required. As noted earlier, the franchising process can be designed to overcome this problem, making the market more contestable to potential operators.

To facilitate the franchising process, the main coal lines could be horizontally separated from other networks. The isolation of the network, together with transparent information on the costs and revenues of the franchise would provide confidence to coal companies that monopoly pricing practices had been eliminated.

Interstate network

The interstate network can be broadly defined as the standard gauge track linking all mainland state capital cities. The markets served by the interstate network are varied, including freight (generally containerised) and interstate passenger services.

The financial returns on the interstate network have traditionally been poor. Although never highly profitable, the profitability of the National Rail Corporation (NRC), which carries freight on the interstate network, deteriorated significantly after the introduction of private operators on the network in 1995-96 (PC 1999, 29).[19] There is strong intermodal competition (from road and coastal shipping) in almost all markets served by the interstate network.[20] The key feature that

differentiates the interstate network from regional networks is that for the former there are multiple network owners, responsible for allocating train schedules and undertaking investment.

Currently the Australian Rail Track Corporation's responsibilities for the interstate network are limited to the track that it owns (that is, in South Australia and parts of New South Wales, Western Australia and Northern Territory) or manages (Victoria). Operators face significant costs in negotiating access and train schedules with numerous owners.[21]

Figure 2 shows that he interstate network initially lost considerable market share to road, in both the transport of non-bulk freight and interstate passengers.[22]

The operating deficits of the network have discouraged investment, resulting in a deterioration of the infrastructure, further eroding the competitive position of railways. It has been estimated that more than half the expenditure of the Commonwealth from the late 1970s to 1996-97 covered operating losses and historical debt of its railway bodies (HORSCCTMR 1998). This, it has been argued, diverted expenditure from capital works. Some participants to the PC's rail inquiry noted that there has also been "neglect" of the interstate network by state governments (PC 1999, 237). A number of reports in the 1990s (HORSCCTMR 1998; Maunsell 1998; Booz Allen & Hamilton 1998) presented evidence of the inadequacy of rail infrastructure. Participants to the PC's inquiry also discussed the inadequacy of investment the contributed to problems in the interstate network and hindered rail's ability to compete (PC 1999, 236–38).

There are two main underlying causes of the loss of competitiveness of rail. First, government ownership and incentive arrangements have impeded the ability of train operators to improve operational efficiency and achieve dynamic efficiency gains through market segmentation and better integration into the transport logistics chain. Second, the multiplicity of network managers imposes costs on train operators in negotiating train schedules and access charges. This impedes the efficient allocation of train schedules, overall use of the network and investment.

These impediments can in part be overcome through the proposed privatisation of NRC and encouragement of more rail-on-rail competition from private niche operators. To overcome the problems associated with multiple owners of the track infrastructure, integrated management of the network is required. This could be achieved by establishing a single network manager to manage the operation of the interstate track on behalf of both train operators and track owners. This approach has a number of possible advantages. For instance, it reduces the coordination issues inherent in having multiple managers of the network. It also avoids the conflicts of interest that could arise if the manager also owned the track or rollingstock. An access regime could allow for train schedules to be allocated by auctioning or other market trading methods. This would maximise the economic value of the network by allocating train schedules to those operators that valued them the highest. Flexible pricing arrangements would facilitate investment.

The successful implementation of this approach would be dependent on the vertical separation of train operations from the track infrastructure. This is to avoid any conflict of interest or difficulties that may arise from one party both owning one segment of the network and providing train services in competition with other operators.

VIII Implications for existing arrangements

The differentiated approach described above has different implications in each Australian jurisdiction because of differences in the characteristics of their railways. The potential for further reform exists in them all.

It has particular implications in states where coal lines are horizontally integrated with the rest of the network (Queensland and NSW), or where freight operations are still government-owned (Queensland, and until the sale of FreightCorp was announced, NSW). In New South Wales, consideration could also be given to going further and reintegrate the track and operations. It could adopt the Victorian model such that the privatisation of FreightCorp would involve a long term lease over the non-metropolitan intrastate track (with appropriate access arrangements). All passenger services could be franchised. The franchisees would buy (or lease) the rollingstock and lease the track from the government.

Further reform of the interstate network has particular implications for the Commonwealth, New South Wales, and Western Australian Governments. They are currently owners of parts of the network and have separate access regimes. The single network manager approach would be more effective if the interstate

network is vertically separated and the manager did not own the track infrastructure. This approach would allow coordinated management and promote competition over the entire interstate network, generating significant benefits and give rail an opportunity to strengthen its competitive position on this important transport corridor.

Further investigation could also show that the PC's recommended approach may have relevance for some networks in other countries.

The European network, for example, traverses many countries in the same way as Australia's interstate network traverses a number of states. It is used heavily by both freight and passenger trains. This suggests that the approach suggested for Australia's interstate network — involving vertical separation and a single network manager — could be relevant in this context.

Like Australia's regional railways, Eastern Europe railways are often heavily involved in moving general and bulk freight to ports. Where there is already sufficient intermodal competition, consideration could be given to greater private sector participation in vertically integrated, horizontally separated railways.

IX Conclusion

The Australian Productivity Commission considered that the overarching objective of rail reform should be to improve the efficiency of a country's transport system. It argued that it should not be seen as a means of involving the private sector to compensate for inadequate government investment in loss making railways.

An important conclusion from the Productivity Commission inquiry was that the implementation of a common reform package is unlikely to overcome the impediments to improved performance in all markets. Individualised approaches need to be developed on a case-by-case basis for each type of rail network.

Crucial to developing individualised approaches is identifying the characteristics of markets and their boundaries. Even where rail infrastructure is considered a 'natural monopoly' in a technological sense, other characteristics influence the ability of providers to exercise market power and, thus, the appropriate policy approach for a particular network. These characteristics, which will differ across rail networks, include the strength of intermodal competition from air and road, the degree of competition in downstream markets, and traffic density. As such, the appropriate structural and ownership arrangements will differ for long distance, regional and urban passenger rail networks.

Tradeoffs are inevitable. While vertical separation may assist in promoting competition and reducing monopoly rents, it may result in a lack of accountability, major coordination problems and significant safety concerns, as evidenced in

Great Britain and New South Wales. In particular, the implementation of strong access regulation to promote competition may diminish incentives for business to invest in maintaining and upgrading the rail infrastructure. Horizontal separation of different networks may promote viable businesses but interface issues between networks may arise. Where viable, however, horizontal separation can allow different policies to be implemented for networks with different characteristics.

Systematic analysis of structural reform and ownership options would involve assessing the relevance and likely magnitude of the associated costs and benefits.

This paper has highlighted considerations that may be relevant to determining the preferred vertical structure of particular networks.

- Where there is sufficient intermodal competition and the possibility of rail-on-rail competition developing, vertical separation would be appropriate. Benefits are likely to be most significant when infrastructure and operations are relatively independent (OECD 1999).
- Where there is intermodal competition but little possibility of rail-on-rail competition (for example, where the potential market is small), gains from vertical separation are unlikely to outweigh the costs. In this case, vertical integration and promotion of competition for the market (through franchising, for example) would be preferred.
- Where there is market power in the network, vertical integration may also be appropriate. Periodic retendering and the awarding of contracts on the

basis of the lowest freight rate can help to reduce monopoly rents. Vertical separation, on the other hand, could result in the transfer of monopoly rent from train to track operations. In addition, where there are barriers to entry such as sunk costs in above rail operations, rail-on-rail competition is unlikely to develop.

In short, there can be no 'one size fits all' approach to rail reform. Care must be taken to ensure that the reform strategy adopted is relevant to the network type, taking into account its economic characteristics, and is only implemented when the gains exceed the costs.

Post script

Since this paper was originally presented, the Australian rail reform process has continued, including the sale of NRC and FreightCorp in January 2002, and the establishment of access arrangements for the parts of the interstate network controlled by the Australian Rail Track Corporation.

In addition, several developments have highlighted difficulties that can arise in implementing reform.

In December 2002, one of the private operators of the Victorian urban rail passenger network (M-Train), which had incurred large financial losses, withdrew from the system. (Its part of the network is being operated by receivers on behalf of the Victorian Government, until a decision is made about longer-term arrangements.) Several factors are likely to have contributed to M-Train's withdrawal. In part, it may reflect problems with horizontal separation within a

market (eg urban passenger), if it leaves individual providers with a market which is too small and/or fragmented. Connex, the current operator of the other part of the system, argued that horizontally separating the Victorian urban network has been inefficient, and has expressed interest in operating the whole system (Masanauskas 2003). Thus, the attempt by the Victorian Government to adopt a 'one size fits all' approach to its urban network, by emulating the UK, appears to have failed because it paid insufficient attention to local conditions, particularly the relatively small size of the market. This does not, however, undermine the principle of horizontally separating the urban rail passenger network from other rail networks.

In 2001, investment disincentives — purportedly created by the pricing rules for the rail freight access regimes in Victoria and New South Wales — were raised as an issue to a Productivity Commission inquiry into the Australian national access regime (PC 2001). The potential 'chilling' effect of access regulation for investment (in all industries) was highlighted as a major concern in the Commission's final report (PC 2001). It suggested some general principles that would allow access regimes to facilitate efficient new investment. These included setting regulated access prices to generate expected revenue that: at least meets the efficient long-run costs of providing access; covers the directly attributable or incremental costs of service provision; and includes a return commensurate with (regulatory and commercial) risk.

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Notes

1. This paper is based on the report of an inquiry into progress into rail reform undertaken by the Productivity Commission for the Australian Government in 1999 (PC 1999). However, some views expressed in this paper do not necessarily reflect those of the Productivity Commission. I am grateful to John Salerian, Kim Gusberti, the seminar discussants and referees for comments and assistance.

2. Discussion of rail reform in Argentina, Australia, Great Britain, Germany, Sweden and other European countries can be found in World Bank (1996), PC (1999), Kain (1998), Bowers (1996), Jansson and Cardebring (1989) and ECMT (2001).

3. The British Government released a White Paper in 1992 proposing changes to the railways. The Railways Act 1993 allowed the structural reform of the railways, which were sold or franchised in 1997.

4. PC (1999) benchmarked Australia's railways with selected systems in Europe, America and Japan. Railways in other Asian countries were not examined.

5. Rail reform in Australia is discussed further in PC (1999), Salerian (1999) and Scrafton (2001).

6. The States and Territories of Australia are New South Wales, Victoria, Queensland, South Australia, Western Australia, Tasmania, Northern Territory and Australian Capital Territory.

7. IC (1991) and PC (1999) discuss the restrictions that existed on the intrastate carriage of particular commodities. For example, rail was required to transport coal (in NSW and Queensland) and domestic grains and petroleum (in Victoria, Queensland and Western Australia).

8. In 1995 the Council of Australian Governments agreed to implement a package of measures to extend competition policies to previously exempt sectors of the economy. A Competition Principles Agreement established principles for structural reform of public monopolies, competitive neutrality between the public and private sectors, prices oversight of government business enterprises, regimes to provide access to essential facilities and reviews of legislation restricting competition.

9. The former AN system now consists of two private operators (Australia Southern Railroad, Australian Transport Network), a corporatised government freight operator (NRC), a private passenger train operator (Great Southern Railway) and a government track authority (ARTC).

10. NRC is 70 per cent owned by the Commonwealth, with minority stakes held by NSW (20 per cent) and Victoria (10 per cent).

11. The NSW Labor Government support for the sale of FreightCorp was based on Commonwealth Government decisions to privatise NRC but prohibit the sale of NRC to FreightCorp. The NSW Government argued that the privatisation of NRC would have left FreightCorp vulnerable to ‘cherry-picking’ of its most profitable contracts by NRC. After much debate, the NSW Country Labor Conference in

November 2000 voted to condemn the privatisation of NRC, but to make it a condition of sale of Freight Corp that it be sold to the same bidder as NRC (Murphy, 2000). An Upper House Committee of the NSW Parliament also made several recommendations about conditions to be attached to the privatisation which were incorporated in legislation (NSW Legislative Council 2001).

12. The Trade Practices Act 1974 prohibits mergers and acquisitions that have the effect or likely effect of substantially lessening competition in a substantial market. The ACCC has the power to reject mergers that would substantially lessen competition, but can also 'authorise' these where there is sufficient public benefit.

13. In October 1992, a committee inquiry was established by the Prime Minister, with the support of State and Territory Governments, on the need for a national competition policy and its basic principles. The report of the inquiry (Hilmer, Rayner and Taperell 1993) became known as the Hilmer Report, after the Committee's chairman Frederick G. Hilmer.

14. The PC Inquiry report recommended privatising all remaining government – owned freight operations, with special arrangements for the rollingstock on the main coal lines (PC 1999, 145-51).

15. PC (1999, pp. 107–8) discusses the potential costs of vertical separation in more detail. Further information can also be obtained from: Kessides and Willig (1995); Brooks and Button (1995); Thompson (1997); King (1997); OECD (1998); van de Velde and ven Reeven (1998); and OECD (1999).

16. The PC identified five stages in the implementation of the purchaser-provider framework, including the specification of policy objectives, specification of rail services required to promote the objectives; determination of the level and form of subsidy; delivery of specified services; and costing of rail services (PC 1999, 12-16).

17. The establishment of the 25 horizontally separated passenger franchises in the United Kingdom is an example. In Victoria, the UK approach was adopted with the horizontal separation of the Melbourne urban train system into two franchises (Bayside Trains and Hillside Trains).

18. In Australia, network interface issues are of particular concern in Sydney where congestion in the urban passenger network restricts the passage of freight trains. Interface issues also arise between the interstate and regional networks, as well as between the main coal lines and regional networks.

19. NRC made operating losses of between A$5 million and A$31 million in the period 1996-97 to 1999-00 and recorded a modest profit before tax of A$2.3 million in 2000-01.

20. For example, in 1994-95 the interstate transport of bulk commodities was dominated by coastal shipping (95% of the market). In contrast, road dominated the transport of non-bulk freight (57 per cent of the market compared to 32 per cent for rail).

21. Currently four authorities are responsible for the administration of access, five authorities have a role in allocating train schedules and five authorities undertake investment in the network.

22. Rail market share of freight traffic on the East-West Corridor reached a low of 65.2% in 1995-96 but has started to rise again, to 77% in 1999-00, the highest level in a decade. This in part reflects the recent growth in rail-on-rail competition from niche private operators (ARTC 2001).

Box 1 **Definitions relating to structural separation**

Structural separation: businesses are separated into discrete legal entities

Horizontal separation: occurs either by product (freight and passenger services) or by geographic area (interstate, regional and urban railways).

Vertical separation: functional levels are separated (track infrastructure and train operations).

Above track or **train operations:** the provision of rail freight and passenger transport services involving locomotives and other rollingstock.

Below track or **track infrastructure:** physically fixed rail facilities such as track, sleepers, signals, terminals and yards.

Table 1 **Overview of structure and ownership of overseas railways, 1999**

Country	*Structure*	*Train operator*	*Track infrastructure*
Argentina	Horizontally separated and vertically integrated	Franchisees	Government
Canada	Horizontally separated (by function) and vertically integrated with access for passenger services	Various private	Various private
Germany	Horizontal and vertical separation of accounts	Governments and private	Government
Great Britain	Horizontally and vertically separated	Franchisees	Private
Japan	Horizontally separated (by function) and vertically integrated with access for freight services	Franchisees and government freight operator	Government with franchisees having control of track
Netherlands	Horizontally and vertically separated	Government and various private	Government
New Zealand	Horizontally and vertically integrated	Private	Government (leased for nominal rent)
Sweden	Horizontally and vertically separated	Government and various private	Government
United States	Horizontally separated (by function) and vertically integrated with access for passenger services	Various private	Various private

Source: PC (1999, p. E2).

Table 2 **Structure and ownership of Australian railways, 1999**

Jurisdiction	*Structure*	*Train operator*	*Track Infrastructure*
Commonwealth	Vertically separated	Government and various private	Government
NSW	Horizontally and vertically separated	Government and various private [a]	Government
Victoria	Horizontally separated and vertically integrated	Private	Government (lease urban and non urban)
Queensland	Horizontally and vertically integrated (with access for third parties)	Government	Government
Western Australia	Horizontally separated and vertically integrated (with access for third parties)	Government and private	Government (lease non urban)
South Australia	Horizontally separated and vertically integrated	Government and private [a]	Government (lease non urban)
Tasmania	Horizontally and vertically integrated	Private	Private

a NSW's FreightCorp has won a major coal haul contract in South Australia and NR is operating intrastate services in NSW.

Source: PC (1999).

Box 2 **Definitions relating to competition**

Intermodal competition: competition between rail and other modes of transport, such as road and coastal shipping.

Competition 'for' the market: competition between bidders tendering for the exclusive right to provide a specified service over a given period of time.

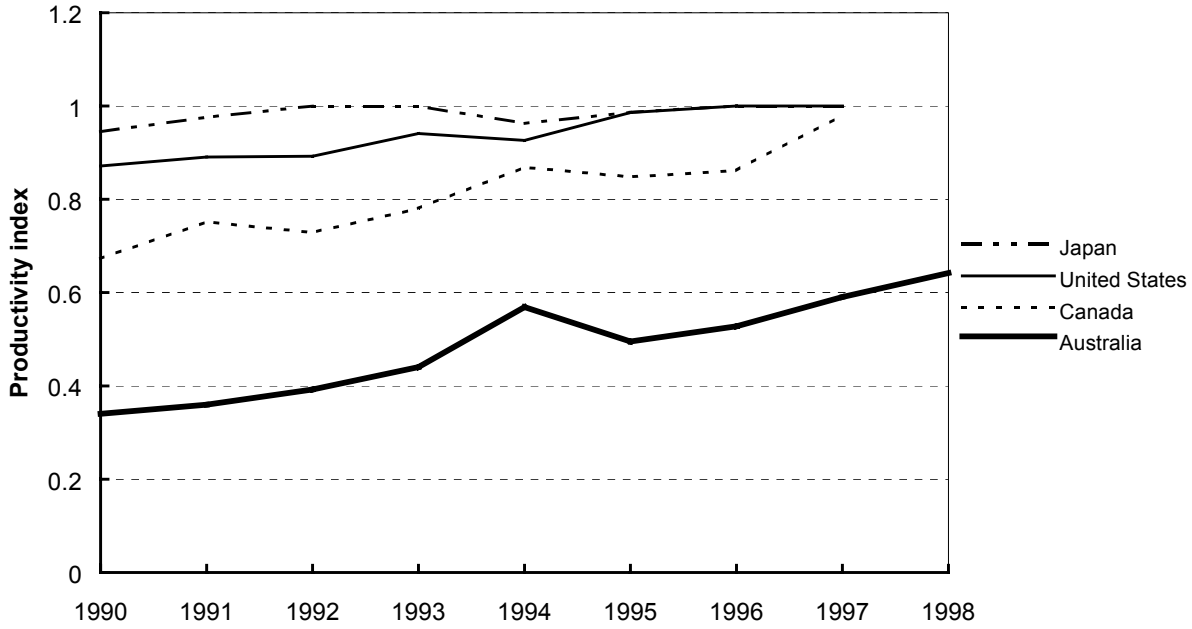
Competition 'in' the market: competition between train operators for the same customers on a given network (rail-on-rail competition).

Competition for train schedules: competing demands by train operators for access to the track infrastructure. This can occur between train operators serving different markets (for example, freight and passenger services); between operators competing for the same customers; or between trains with different origins/destinations wishing to travel over common segments of the network.

Competition in downstream markets: competition in markets which railways serve.

Yardstick competition: involves comparing the performance of organisations with similar objectives operating in separate geographic markets.

Figure 1 **Productivity levels of freight and passenger systems**



Source: PC (1999, xxiv).

LEGEND:

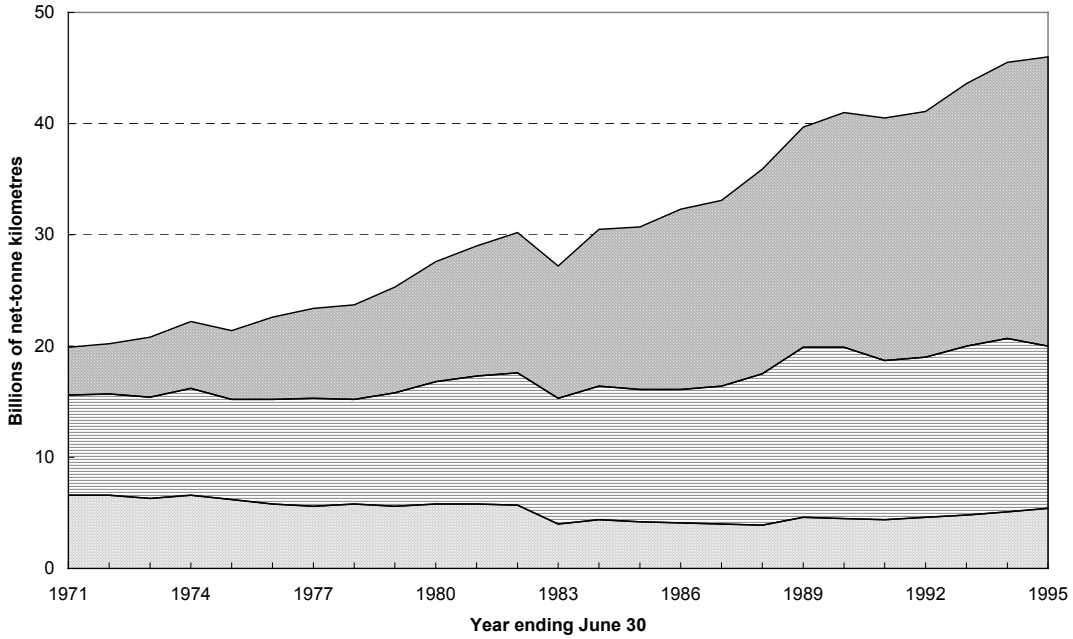
Japan

United States

Canada

Australia

Figure 2 **Non-bulk interstate freight, Australia, 1970-71 to 1994-95**



Source: PC (1999, 15), based on Perry and Gargett (1998).

LEGEND:

Road

Rail

Coastal shipping