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The Evolution of the World Bank's Railway Lending

Alice Galenson
Louis S. Thompson

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Alice Galenson
Louis S. Thompson

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FOREWORD

Railways have long posed problems for governments in developing countries. Inefficient rail operations combined with chronically inadequate earnings perpetuate problems of deficiencies in basic infrastructure provision and maintenance. These problems were magnified when many countries entered macroeconomic crises which prevented governments from continuing financial support to rail operations or from reinvesting in prematurely deteriorated assets. The problems also manifested themselves in the need to change the role of the railway in countries which are transitioning from planning to market economies.

The Bank has been extensively involved in helping governments to address these problems. In the last decade in particular, the Bank has increasingly encouraged governments to introduce the institutional reforms necessary to permit running their rail undertakings on more commercial lines.

In summarizing the Bank's experience, the paper concludes that the Bank has made real progress in dealing with railway restructuring in cases where the borrowing country was willing to make the organizational effort and commit the political capital. Railway restructuring is never simple, but the Bank has identified a series of relatively well developed techniques for designing and managing the process of change. The Bank also has devised a set of options available for changing the organization of the railway in order to make it more responsive to the demands of the borrower's transport market. The paper discusses the ways in which the role of the private sector in railway services can be increased, while recognizing that full privatization is not usually an option. The potential role of railways in reducing energy consumption and enhancing environmental quality is another point of emphasis in the paper.

While the techniques for improved railway lending are now available, the paper also shows that some borrowers, for various reasons, may not be ready, or willing, to use these proven approaches. The paper discusses the methods by which countries ready for successful reform can be identified and assisted, and concludes that railway reform is often too important for the Bank to ignore, but that the process will take sustained and patient effort on the part of the Bank if it is to be successful.



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ABSTRACT

Railways are important components of national transport systems. They have significant macroeconomic impacts through employment, financial deficits, service to other parts of the economy, and links to international trade. They can also play a constructive role in promoting energy efficiency and environmental enhancement. As a result, the Bank has been active in railway lending since the Bank's inception, and should continue its involvement. This paper examines the Bank's experience in railway lending, beginning with the technically focussed, project-type loans of the early years and continuing through the results of the more recent and broader sector, public enterprise and structural adjustment lending. The paper reviews railway restructuring experience in developed countries, develops the lessons to be learned from developing and developed country railway reform, and discusses the role which enhanced private sector involvement has played, or could play, in improving railway performance. The paper concludes that the Bank's lending to railways has measurably improved over the last decade, but that the direction and degree of change can be further enhanced. Finally, the paper proposes a new framework for railway lending, with increased emphasis on the need to understand and reshape the railway as an institution and on adjusting the Bank's lending program to the characteristics of the railway and the country's national policy environment.

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EXECUTIVE SUMMARY

Railways have a viable role in many countries if they are given proper goals and allowed to function effectively. Depending on the size, location and resources of the country, railways can be essential in moving large volumes of basic commodities (coal and iron, or wheat, maize and rice) and in moving containerized freight as part of an international logistics chain. The railway role in passenger transport requires more attention. Some countries such as Russia, India and China have such enormous volumes of intercity passenger flows that rail has a clear economic advantage which may well extend to dedicated and higher speed, higher quality services; other countries, such as Argentina, have no need for intercity passenger rail services, but passenger rail has a role in their increasingly congested urban/suburban agglomerations.

Some important railway roles are potentially profitable or at least commercial, and provision could be left to market forces; other rail roles are necessarily “social” and need better policy guidance and financial support from their governments. Most freight services and certain longer distance passenger services are in essence “commercial” activities in that their tariffs could be set to cover costs. If the railway’s costs for these services cannot be covered from tariffs, it should abandon the service. By contrast, suburban passenger services normally must be provided at rates below the railway’s cost and therefore need subsidies. It is far easier to insulate a commercial railway from government interference than a “social” railway.

In the right circumstances, railways can help in dealing with energy consumption and environmental pollution problems faced by borrowing countries. Under the right circumstances, railway services can be an indispensable component of a more economically and environmentally sustainable transport network, especially in urban areas.

The traditional view of the railway as a monolith is no longer valid. With appropriate organizational design, private operators can provide services on public track, railways can have separate profit centers (even for publicly-supported services), traditional functions (such as locomotive maintenance) can be let out on contract, competition can be created among several railways on the same track, and the private sector can be brought in as a partner in commercial ventures on railway facilities (for example fiber optics on rail right-of-way).

An enlarged private sector role in service provision will often be desirable. Private sector participation in railways is frequently seen as either impossible, or as a panacea—it is neither. As economies develop and market forces strengthen, governments can and should encourage the private sector to play a larger role in their railway activities, though total privatization is rarely an available choice. There are mixed options which work well if the country understands its objectives and political constraints. The Bank has acquired considerable experience in promoting this kind of development, and adjustment or hybrid investment/adjustment lending instruments are most useful.

Railway functions which continue to have public support should be operated on commercial terms. This involves better organization along lines of activity, effective regulation, explicit agreement between railway and government as to goals, authorities and responsibilities, and payment by government for social services.

Successful railway restructuring requires understanding and commitment at the highest political levels. The short-term political risks of dealing with a railway's labor force and shifting its critical role in the economy's transport sector often appear to outweigh the long-term gains from putting the railway on a more secure footing; the highest levels of the government must understand the risks and be willing to pay the price. Restructuring needs the support not just of the railway and transport ministry, but also finance, planning *and* chief executive.

Railway issues can be too important, both in transport and macroeconomic terms, for the Bank to ignore. Railways are often a vital part of the transport network. Where poorly managed and subjected to political interference (all too frequent), the railway is typically one of the country's larger macroeconomic and public finance problems as well.

The Bank's approach to railway lending has changed from a technical and project focus to a policy focus. As in many other areas of Bank lending, the Bank has learned that the problem is far deeper than worn out assets and outdated technology.

Experience in the 1970s and 1980s in a number of developed countries proved that the "railway problem" can be alleviated. The process was slow, financially expensive, politically painful, and laced with mistakes and false starts, but significant progress has been achieved. A number of lessons emerge from the experiences:

- The functions of the railway need to be clarified and divided into market-driven versus socially-driven (often called Public Service Obligations or PSOs) components.
- The railway should be organized in "profit" centers along its lines of market activity, typically freight, intercity passenger, suburban passenger, and others.
- The railway needs effective incentives and clear authority -- permitting more effective management internally, and better accountability externally.
- There must be appropriate changes in regulation and other government intervention reflecting the new responsibilities and authorities of the restructured railway.
- Barriers to change, such as redundant labor, excessive debt, uneconomic trackage, or unsustainable retirement obligations, need to be removed.
- Civil service restrictions should be eased or lifted.
- The restructuring process proceeds better when the planning and policy analysis are carried out by, or at least assisted by, a professional and impartial party outside the railway and the government ministry affected by the restructuring.

Attempts at railway restructuring in the developing countries, with various types of Bank involvement, began to take place during the late 1970s and the 1980s. The experience offers valuable additions to the store of knowledge as to what works in supporting change. Many of the lessons learned in developing countries are in common with developed countries; some added lessons, different in emphasis as well as form, are also significant:

- The sheer administrative capability of the government can be overwhelmed by railway restructuring. Adequate resources for planning and management are essential.
- The Bank cannot impose restructuring through loan conditionality.
- The Western management model of assigning clear authority and responsibility combined with delegation of decisions to the lowest feasible level may not be appropriate in all cases, at least at the outset of change.

The challenge to Bank lending is to assist in restructuring the railway, including its relationship with the owning government, so the railway can find a rational market and social role. This is particularly difficult in the former socialist countries where the railway must make the transition from being the dominant mode to being only one of a set of competitive choices in an economy shifting away from basic commodity production and toward higher value, service sensitive functions.

The techniques of railway restructuring are reasonably well understood. Four broad types of effort are involved: a strategic plan to define the railway's overall economic role and the impact of alternative policy choices; a performance agreement to define clearly the relationship between the railway and the government; a management plan to permit the chief executive of the railway to assign targets for railway managers and hold them accountable for performance; and, an enabling actions plan to ensure that all of the changes in regulation, legislation and administrative procedure necessary to implement the restructuring process are completed. Where there is a significant opportunity to involve the private sector in the restructuring program, the Bank should make a major effort to foster such a change.

The form and degree of restructuring, and the Bank's role in it, will vary among countries and the context in which the railway operates. For large railways still operating in a strong "planning" context (Russia, India and China), the Bank's focus should be on helping railway and government to plan for the transition to a market-driven context, and on introducing the tools of modern railway management which will be useful both now and when the new market rules emerge; in these cases, project lending is still a useful approach, and technical assistance can focus on operating skills and techniques. In cases where markets are already effective and regulated competition is adequate (Mexico, Argentina, Chile, Brazil, and possibly a few countries in Africa and Asia), the focus should be on commercial operations, defining social services and the related compensation, and promoting a greater role for the private sector. Sectoral and adjustment lending are more appropriate, and technical assistance should be concentrated on developing capabilities for strategic planning and commercial management in a competitive environment. Many railways operate, unfortunately, under a regime of continual interference from their governments. These railways (Nigeria, for example) are the worst performers, and offer the highest risk to lending operations. The preferred approach would use sectoral or adjustment lending with emphasis on up-front conditions. Conventional technical assistance is often wasted in these cases because the prevailing incentives do not encourage effective use of the training or skills acquired (e.g., training on maintenance is wasted if the trainee works in a workshop without spare parts or requisite equipment—or is immediately transferred to another department in the railway).

Railway restructuring is more difficult, and the need for Bank involvement greater, when the railway role must change significantly, particularly if it must be adjusted downward. Managing the process of shrinkage and restructuring is likely to include difficult decisions on line abandonment, labor

redundancy, clearer separation of regulatory and operating roles, levels of subsidies, and services to be given priority under resource constraints. These are decisions which the railway and transport ministry can rarely make or implement alone. The Bank's involvement through adjustment lending can bring vital visibility and support from other levels of government.

Change is possible, and the Bank can be instrumental in the reform process; but it takes time, resources, and continuity in Bank effort. The best example of a successful recent Bank loan is Argentina. Promising initiatives are now underway in Malawi, India, Cameroon, Côte d'Ivoire, Burkina Faso, Peru, Poland and Tanzania; and substantial progress has already been made in China and Hungary.

1

INTRODUCTION

Railways are an important part of World Bank lending. The Bank has supported over 170 railway projects since 1949, and total railway lending has amounted to US\$10 billion, of which about 80 percent was IBRD and the remainder IDA. This represents 23 percent of lending for transport and 3.3 percent of all Bank lending.

The initial approach to Bank railway lending in developing countries emerged from the Bank's early experience in the reconstruction of Western Europe and Japan—a physical infrastructure orientation, with emphasis on rebuilding, rehabilitation and technical efficiency. This facet of railway involvement was, and remains, significant. Many of the Bank's borrowing countries are missing necessary infrastructure. Many are in desperate need of rebuilding or rehabilitation as a result of neglect or internal conflict, and most perform at levels below (some far below) typical railway performance in developed countries. Service qualities are often low, with productivity of capital and labor equally poor. In many railways the availability of locomotives is below 50 percent; for several railways the wage bill alone exceeds revenues (more than double in Colombia and Uruguay in 1987), and in many others the working ratio (the ratio of cash operating payments before depreciation and financing costs to revenues) is well over 100 percent.

Railways often play an important role in a country's domestic freight transport system. In the economies which developed along "socialist" lines, for example, the preponderance of rail and truck freight tonne-km (from 62 percent in Hungary to over 90 percent in Romania and the Commonwealth of Independent States (CIS)) moves by rail. Other countries (China and Zambia) depend heavily on rail for long distance transport because other modes are not yet developed. All economies which produce or consume large amounts of bulk commodities, such as mineral ores, could benefit from the lower cost which efficient rail can offer.

The rail role can also be important for intercity and suburban passenger service. Indian Railways (IR) is now the world's largest rail passenger carrier, and China Railways (MOR) is virtually IR's equal: each carries more passenger traffic (passenger-km) than *all* of the Western European and North American railways *combined*, and each may ultimately offer a market for higher speed, dedicated passenger facilities as now exist in developed economies. Many developing country mega-cities such as Moscow, Buenos Aires and Bombay are heavily dependent on rail for urban transport, and the potential for railways to make a contribution to resolution of environmental pollution and energy consumption issues of the rapidly growing urban areas in developing countries is manifest.^{1/}

But the railway's impact is not confined to transport effectiveness. Railways are often one of the largest single employers in the country: MOR has a staff of well over 3 million; IR employs 1.6 million; Polish Railways, with a staff of 275,000 in 1992, had 40 percent more employees than the entire U.S. railway industry even though U.S. railways carried over seventeen times as much traffic. In addition, especially in smaller countries, the complexity of rail management often means that the railway captures an undue share of the country's scarce management cadres.

^{1/} See Gwilliam, Shalizi, and Thompson (1994).

Another serious issue is the railway's large and direct financial burden on the public sector budget—and substantial additional railway subsidies are often hidden in other ways such as tax exemptions, uncollected debts, and underpriced inputs. Argentine Railways had a cash deficit (before depreciation) of US\$610 million in 1987, amounting to 9 percent of the public sector deficit and 1 percent of GDP—but its performance had deteriorated to a point where it was carrying less than 10 percent of intercity freight and passenger traffic. Immediately prior to restructuring, Japanese National Railways was running an annual deficit of over US\$13 billion, and had accumulated a debt of well over US\$200 billion. Deutsche Bundesbahn (the former West German railway) required more than US\$14 billion per year in financial support; inclusion and upgrading of the Deutsche Reichsbahn (the former East German railway) has increased this number significantly.

Inadequate rail *service* (whether or not the railway is “profitable”) can exert a different sort of costly drag on the economy. Service deficiencies have caused many railways (Argentina or Nigeria) to lose traffic which could be carried at lower cost to the economy by rail than by other modes. In the socialist economies, excessive dependence on railways has led to apparent “shortages” of transport capacity and to a highly inflexible approach by the railway to meeting service *quality* needs. In China, for example, heavy focus by the railway on high wagon utilization as an indicator of technical efficiency may be imposing heavy burdens on shippers to load or unload wagons quickly, no matter what the shipper's requirements might be. Overcoming the limited interest, even resistance, of railways in meeting customer needs will determine in many countries, especially in Central and Eastern Europe (CEE), the CIS and China, the ultimate success of policies to allow market forces to play a greater role.

Railways also play a critical role in the international competitiveness of many countries. World trade is increasingly governed not just by costs of production and transport tariffs, but also by concerns for total logistic costs, with heavy emphasis on speed, reliability, flexibility, and real-time control over shipments. In this formulation, the “cheapest” (and most energy “efficient”) mode may be at a considerable disadvantage if it is slow and unreliable. Countries whose railways perform poorly are directly—and unnecessarily—ceding a logistical advantage to countries with better rail systems. Programs to improve a country's trade position will have to take the performance of the national rail system into account.

The interaction among railway projects, railway services and environmental objectives can also be significant. While rehabilitation projects are usually limited in scope and within the limits of existing properties, they can have impacts on localized water and soil quality. Recent events in the U.S. have underlined the impact which railway accidents involving hazardous cargo can have on water and air quality, an impact which can be highly dangerous in urban areas. Although infrequent, new railway line construction, as is underway in China and planned in Brazil, can clearly affect the local environment and ecology through increased economic development, but can also improve the local environment through more effective management of the transport implications of development.

The Bank's railway involvement started with project lending, with a focus on railway technical efficiency. Over time, railways began to be supported through loans to other sectors and, more recently, through sectoral or adjustment loans, public enterprise loans, and others. In fact, in the last few years railways have appeared more frequently as components in transport sector or other projects, rather than in dedicated railway projects. In the course of its railway lending, the Bank has often engaged in serial lending to a single railway—Pakistan has had 12 railway or railway-related loans, India has had 17. Given the importance of railways, and of railway lending, there is a valid question whether the expected

benefits have been realized, or whether there is an agreed explanation for the success or failure of particular railway loans. This issue was first raised in 1982 in "The Railways Problem," a Bank report which examined experience with railway lending and concluded that more emphasis was needed on institutional, as opposed to technical, issues. This report continues that inquiry.

The Bank should continue to make direct railway loans in the future. *The Bank may also find it necessary to take a country's railway policy and performance into account in loans which have a much broader focus than just railways, or even transport.* It is therefore important to understand what went right and what went wrong in prior railway lending, whether the Bank is doing things differently and better now, and whether further changes are desirable or necessary.

Chapter 2 first examines the history of Bank lending to railways through the early 1980s and the reasons for the problematic performance of many loans, and then looks at the ways in which Bank lending has changed during the past decade both broadly and in some specific cases.

What form should future Bank lending for railways take? *The basic conclusion is that there has been a significant improvement in the Bank's approach, but that further evolution in lending policies and techniques is desirable.* Chapter 3 reviews the experience of railway policy and institutional change in developed countries. Chapter 4 analyzes the lessons learned from developed and developing country experience. Chapter 5 focuses on the ways in which an enhanced role for the private sector can contribute to railway development objectives. Chapter 6 focuses on a new framework for Bank lending to railways, including policy change, appropriate lending instruments, an approach to railway institutional change (especially for survival in economies and trade regimes which are becoming more market driven) and how the Bank should approach this task in disparate country situations. Chapter 6 concludes that there is a significant future for railways in developing countries, albeit on a somewhat smaller and more efficient scale in some cases. It also concludes that there is a very positive role for Bank lending to railways, both to strengthen the existing entities, *and* to reinforce the process of institutional change and adaptation to a new role within evolving transport systems.

Chapter 6 recommends a three part framework for future lending. For railways in planned, or formerly planned, economies which are often capably managed in a technical sense and which typically have dominant positions within the transport market (China, the CEE and CIS economies), the Bank should focus on improving the government's definition of objectives for the railway and on assisting in adapting the railway's organization to the evolving demands placed on it, while continuing to make carefully targeted loans with technical objectives (locomotive efficiency, for example) which will pay off both under the current policy framework and under future trends in these economies. In addition, it will be critical that the Bank assist the governments and railways in making the change to a market-driven economy. For railways in essentially free market, competitive economies (Argentina, Brazil, Chile, and Mexico) where the railway does not dominate the transport market, the Bank should aim at putting the railway on a "commercial" basis, with appropriate Public Service Obligation (PSO) payments for social functions, and at enhancing the role of the private sector in performing railway services. In these cases, the eventual objectives are often definable and agreed; it is the problems of *transition* which require attention. In a third (and large) group of other cases (which this report terms "interference" economies, as in Nigeria, for example) the Bank should focus on disentangling government from railway so that the process of proper definition of roles and responsibilities can commence with a reasonable prospect for success. In almost all cases, a larger role for the emerging private sector will deserve close examination.

Annex A provides case studies of the experience of railway institutional change in developed countries. **Annex B** presents and discusses certain statistical indicators of railway performance.

THE EVOLUTION OF BANK RAILWAY LENDING

Bank Lending to Railways Before the 1980s

Bank lending to railways through the early 1980s, which totalled over 130 projects and over US\$5 billion, often failed to generate the expected improvement in railway performance. For example, of the 61 railway projects evaluated by the Bank's Operations Evaluation Department (OED) during 1974-88, fully one-third were rated unsatisfactory. This compares to an average for other transport projects of 12 percent and for all projects of 19 percent. In another sample of 50 railway projects for which an economic rate of return (ERR) is available both *ex ante* and *ex post*, the *ex post* return was less than that projected in nearly three-quarters of the projects; in one-quarter of them it was below 10 percent, and in five cases it was negative. (In contrast, out of a sample of 21 highway or rural roads projects reviewed by OED in 1989, over half achieved an ERR greater than or equal to that projected, and only one was less than 10 percent.) Even these results may overstate the benefits, since the rate of return tells only part of the story. A pertinent example is Argentina Railways II (FY79), which had major institutional failures, and one-third of which was canceled, but which had a recalculated ERR of 10 percent (on the investments actually carried out) and was on that basis rated "satisfactory" in its completion report.

This discouraging record is confirmed by a number of other measures of performance. One of the measures most frequently used in conditionality, the working (or operating) ratio, failed to reach its projected level in more than four-fifths of 47 projects examined;^{2/} it was actually worse (higher) than before the project in two-thirds of them (in three cases, slight increases had been projected). Locomotive availability, another commonly used yardstick, was below the projected level in 13 out of 17 cases, and lower than before the project in nine of 19. Labor productivity (traffic units per employee) failed to reach the projected level in 11 out of 13 projects; it fell during the project in six out of 19. Finally, freight traffic, which was projected to grow in all the projects and is a key variable in the rate of return calculations, failed to reach its projected level in 29 out of 31 cases; in 12 of 33 it actually declined.

An analysis of what went wrong in these projects can help identify measures needed to improve the outcome. The common weakness was the attempt to treat symptoms by setting targets rather than to focus on the underlying causes and means of alleviating them. This approach is exemplified by the earliest type of conditions found in Bank projects, namely quantitative targets for numerous operational

^{2/} Altogether 77 projects in 14 countries were reviewed for this study. However, the measures chosen to summarize the impact of the projects on railway performance were not available in all 77 projects, and different measures were available in different projects. Thus, locomotive availability was available before and after the project in 19 cases, and in projections and *ex post* data in 17 (not necessarily the same) cases; the selected labor productivity measure was available before and after the project in 19 cases, but in both projections and *ex post* data in only 13; and freight traffic levels were given for before and after the project in 33 cases, and in projections and after the project in 31.

and financial variables.^{3/} These targets became nearly universal by the late 1960s and are still common today. In concentrating on performance, however, the Bank often neglected the institutional factors and changes critical for improvement. Projects were further handicapped by inadequate attention to the details of implementation and, all too frequently, by the Bank's reluctance to enforce its own conditionality.

The Importance of Institutional Weaknesses

Many projects fell short of their objectives because the Bank either failed to recognize or failed to come to grips with institutional issues. The essence of the problem was the interfering relationship between the government and the enterprise, which led to poorly defined goals, relatively passive management which was unresponsive to changing conditions in the market, political interference in management decisions, inadequate funding, and lack of autonomy.

One common symptom of the lack of government commitment to project objectives has been delays in project processing arising from delays in the execution of the necessary subsidiary loan agreements and failure to allocate adequate counterpart funds. More fundamentally, the Bank often failed to confront and resolve its differences with governments over the basic goals of the enterprise. The series of railway loans to Pakistan illustrates this point. A review carried out after the eleventh railway project found that the borrower did little or nothing of what the Bank asked, and yet rather than ask why, the Bank simply repeated the same conditionality, adding more specifics and more targets. The review concluded that whereas the government favored investment in new assets to meet transport demand, the Bank emphasized measures to increase the productivity of existing assets and labor and the efficiency of sector management and organization. The resulting transport projects have tended to be closer to government priorities in expenditure terms, while closer to Bank priorities in conditionality terms. Since the Bank often yielded on conditionality, its influence on the sector was quite limited.

Another case where the Bank either did not fully understand the institutions or failed to ensure complete understanding by the government of Bank goals is the series of eight railway projects carried out over twenty-five years in Yugoslavia. Conditions calling for comprehensive investment and financing plans and joint railway and government preparation of an action plan to improve management appeared reasonable but were, in practice, impossible in a context where government responsibility for the railway could not be made explicit, firm financial commitments could not be expected from federal and republic authorities, and planning and coordination by the Community of Yugoslav Railways was in direct conflict with the spirit of decentralization. In addition, the Bank tried to encourage Yugoslav Railways to compete in a progressively freer environment, whereas the government wanted to foster national cohesion, preserve jobs, and generate employment. As a result of this fundamental lack of concordance between the Bank and the government, the projects' targets, expressed in financial terms, had little hope of being met.

At times, misunderstandings arose because agreements were made with the wrong parties. Railway projects tended to reach financial and political conditionality agreements with the railway or

^{3/} The earliest Bank projects (and in many cases projects through the early 1960s) had no conditions, nor were rates of return or Project Completion Reports (PCRs) produced. They were generally straightforward investment projects with little institutional content, and they will not be discussed in this paper.

transport ministry which were powerless to carry them out. Limited contact with the Ministry of Planning and Finance during project preparation of the Pakistan transport projects, for example, contributed to the incomplete understanding of the issues on the part of the government and of the political costs and benefits by the Bank. Conversely, there is also a risk that agreement may be reached at the economic or political level, but not with the affected enterprise. In Argentina's Railways II, for example, the railway ignored the studies that were to be carried out, since their implementation thwarted its perceived interests.

Often the Bank's narrow focus on the enterprise led to inadequate attention to political and macroeconomic conditions or policies that would eventually undermine the project. Nowhere is this more evident than in the over-optimistic traffic forecasts found in nearly every project. While optimism was sometimes justified, even the sensitivity analysis rarely included the zero or negative traffic growth rates that often occurred due to lower than expected economic growth, competition from other modes, poorer than expected service, and/or adverse government policies. Another example is the Bank's habitual insistence on tariff increases. While warranted on financial or economic grounds, these increases were often politically infeasible, owing to already high inflation or popular pressure against fare increases. In yet another example, Zambia's shortage of foreign exchange and its import licensing and inspection procedures restricted the purchase of materials and equipment needed for maintenance in the Railways III (FY80) project (and since).

Mexico Railways III (FY76) illustrates well the dangers of overlooking political and economic factors. The audit of that project concluded that despite the fact that the Bank had issued an economic report documenting economic conditions and their future evolution shortly before appraisal, the main problem affecting smooth project execution was the lack of consistency between the railway's Investment Plan and the prevailing economic conditions. The project straddled two administrations, and its success depended on the continuation of the outgoing administration's economic policies, although there was no indication that this would be the case. In fact, shortly after loan approval the outgoing administration enacted a drastic public spending control program, which was followed by another tougher program under the incoming administration; these actions necessitated a substantial reformulation of the project.

Insufficient attention to the lack of enterprise autonomy often compromised performance. For example, frequent changes in management imposed by the government—13 times in eight years—contributed to the deterioration in the performance of Argentine Railways during Railways I (FY71), which was completed six years late after cancellation of one-third of the project. Railways II saw an additional five changes in top management, and government indecisiveness in matters like marketing, tariff increases, and uneconomic lines contributed to further financial deterioration. In the Congo (Railways II, FY76), government interference in the management of the railway resulted in commitments to large contracts for rolling stock and equipment the railway did not need.

Another striking example of political influence on enterprise operations is the failure to deal with labor redundancy, which, though almost universally present, was usually alluded to only indirectly through targets for increased labor productivity. These targets took the place of the much more politically difficult retrenchment of staff, even when it must have been clear that the latter was the only way to realize the former. The targets were rarely achieved. In failing to deal head on with this issue, the Bank also did not acknowledge that over-staffing would probably continue and should therefore be incorporated into project design and justification. The rationalization component of a series of modernization projects in Indian Railways, for example, did not fully reflect the fact that there were serious questions whether

the government had any real intention of carrying out the drastic reduction in work force implied by the technology assumptions. A more realistic approach would have concentrated on technological change more consistent with existing staffing levels or, at the least, while accepting that better technology would have a clear payoff, would have taken a more realistic account of labor savings in the rate of return calculations.

Problems with Implementation and Conditionality

The technical targets frequently adopted for operating and financial measures were often unattainable under existing conditions, and yet many projects overlooked the underlying problems and the substantive steps needed to overcome them. The labor productivity targets which ignored the probable resistance to the required labor force reductions offer a clear example of this shortcoming, and even on the limited occasions when targets for staff reduction were set, there was little or no discussion of the factors that would contribute to or hinder their realization. The reason for the increasing deficits in Pakistan Railway, even with substantial tariff increases, was PR's operational inefficiency and the loss of its land transport monopoly, combined with the continued provision of increasingly uneconomic short haul passenger services. The tariff increases imposed to reduce the deficits, given the level of service offered, probably served merely to accelerate the diversion of freight traffic from rail to road.

Even the limited reform pursued through project conditionality often failed. One reason for this may have been simply that the targets were unrealistic from the start. However, the fact that borrowers were allowed to default on covenants, sometimes time after time in the same or in consecutive projects, signalled that they could continue to ignore conditionality. The series of loans to Yugoslav and Pakistan railways are examples of this practice. It might have been better never to have set the conditions at all (even better to have dealt adequately with the underlying issues) rather than to try to patch things up through long lists of financial or other targets which were unenforceable, short of loan cancellation. Alternatively, some of the loans should never have been made. In the case of Zambia Railways III, the Issues Paper identified thirteen areas of potentially major difficulties. None were resolved before Board presentation, and many, including tariffs, subsidies, foreign exchange for spare parts, and organization of the railway, did indeed result in difficulties during implementation.

It is important, though, to emphasize that the early lending record also contains positive achievements. Even when many conditions are not met, some benefits may still emerge, as in the case of Yugoslavia, where an evaluation by the Bank concluded that despite the delays, cost overruns, and numerous failures to comply with conditionality, Bank financed projects did genuinely assist in upgrading and modernizing Yugoslav Railways. Operational efficiency and quality of service improved, carrying capacity increased, and organizational practices were strengthened. Financial results, while not encouraging, would have been worse without the Bank's insistence on tariff increases. Most important, by the end of the 1980s the government had abandoned its reliance on purely political decision-making in favor of cost-benefit analysis for choosing among investment alternatives. The Bank can also take credit for introducing economic investment evaluation techniques in China, India, and Pakistan where, as in Yugoslavia, multiple loans afforded the vehicle for convincing governments to change entrenched practices.

Bank Lending in the 1980s and Beyond

In the Bank as elsewhere during the 1980s, attention turned increasingly to the reform of public enterprises, as reflected in the World Development Report of 1983 and numerous other documents.^{4/} Evidence from around the world demonstrated the increasing costs of existing practice and the potential benefits from fundamental reform of public enterprises and their environment. The burden of unprofitable public enterprises was mounting, and it was becoming clear that attacking the symptoms did not help. Since project lending often failed to bring about desired changes, public enterprises were increasingly included in adjustment operations, which could more readily encompass a systematic reform of policies and procedures. Many SALs and all PERLs (public enterprise reform loans) addressed the relationship between enterprises and the state.^{5/}

"The Railways Problem,"^{6/} written in 1982, reflected this evolving approach to lending for public enterprises. It established a set of minimum criteria for Bank financing, aimed at realizing structural change and more efficient operations. The criteria were: a well-defined economic role for the railway (to be reflected in realistic traffic forecasts); agreement with the government that the objective is more efficient operation of the railway, in competition with other modes; a start on improved functioning of transport markets (through reduced regulation and more appropriate taxation of competing modes), closure of uneconomic lines and/or increased managerial freedom; a start on internal reforms (management, planning, marketing, and costing); definition of an investment plan, free of significant uneconomic investments; and substantially completed engineering designs and operational action plans covering key problems. Subsequent experience showed that not only were these criteria correct and necessary, but that it was also important to achieve them all, and up front, if the real benefits were to be realized. Though the principles were correct, still missing was an analysis of *how* to bring about the substantial reforms that were required.

Although the number of dedicated railway projects continued as before to average about four per year through most of the 1980s, there has been a growing tendency to include railways in transport sector or adjustment lending. Whereas through FY88 the bulk of projects dealing with railways were dedicated railway projects, since then less than one-third have been so narrowly defined, and most of the restructuring is contained in the others. Of greatest significance in these projects is the increased emphasis on the institutional framework, as well as on the political and economic context. Details of implementation are treated more fully, and conditionality has become more detailed and accurately focussed. A look at the results emerging from some recent railway loans reveals the potential for progress in the new approach.

Institutional Reform Becomes the Central Issue

Institutional reform (beyond mere reorganization) appeared occasionally in projects beginning in the early 1980s, and by the end of the decade most projects included it in one form or another (see

4/ See, for example, Shirley (1989).

5/ See Nellis (1989).

6/ See World Bank (1982).

Box 2.1). The shift has been gradual and has taken place at different times for different countries. The SEFICS Railway project in FY81 privatized a significant segment of Senegal's rail transport and demonstrated that the private sector could maintain higher technical and financial standards of operation, higher staff discipline and greater accountability than the public sector. More recently, significant privatization has been an element of projects such as the Argentina PERAL (FY91), the Colombia Public Sector Reform loan (FY91), and Zambia's Railways IV (FY85); and private sector involvement is included in Mozambique (Beira Transport Corridor, FY90—proposals for private participation in warehousing and container freight stations), Poland (Transport I, FY90—eventual spinoff of manufacturing and repair subsidiaries), Sudan (Railways Emergency Recovery Program, FY89—privatization of ancillary services), and India (Container Logistics, FY94—sale of minority share in CONCOR to private sector). In some cases, such as China and India, projects are still primarily investment-oriented, although the focus is now shifting toward facilitating institutional change. In the large majority of the most recent projects, the change is unmistakable, and a review of planned rail-related lending beyond FY94 shows greatly increased emphasis on reform, with virtually all loans having a private sector development component.

Performance agreements have been the most popular vehicle for reforming and clarifying the government/enterprise relationship. Few traditional railway projects have included them, but about half of the 27 or so other projects with railway components approved since FY82 contain them, in countries such as Bolivia (Export Corridors, FY89), Mexico (Railway Sector, FY85, and PERL, FY89), Morocco (PERL, FY87), Tunisia (PERL, FY89), Uganda (Transport Rehabilitation, FY94), Gabon (SAL, FY88) and Ghana (Transport Rehabilitation, FY88).

Experience with various reforms aimed at reducing public interference has shown that the realization of reduced costs and improved quality depends critically on whether effective competition exists. This is equally true whether enterprises remain in the public sector or are privatized. The proposed Public Sector Reform loan in Colombia aims to establish a level playing field between the public and private sectors, reforming regulation where it has constrained competition. Regulatory modernization was also a factor in Madagascar Railways III (FY86) and the Morocco PERL. Various pieces of sector work recommend regulatory reforms, including, for example, the liberalization of truck imports in Hungary to encourage competition with the railway.

Another significant change in many recent loans is the explicit attention given to labor redundancy. For example, Zaire's First Transport Rehabilitation project (FY89) required staff reduction in two public transport enterprises by 2,000 each, and the Sudan Railways Emergency Recovery Program included a target for staff reduction of 9,000 (from 32,000). The Argentina PERAL was, in a sense, largely a labor redundancy project. Sector work has also been devoted to the topic, as in Tunisia, and a research project on labor redundancy in transport enterprises has been completed. Some projects, on the other hand, still do not address the labor issue satisfactorily. The Pakistan Transport Sector project (FY90) relies on attrition, which will not be able to cope fully with the excess labor in the railway, and the Bolivia Export Corridors project does not address the cost of the lay-offs that are needed to make the railway profitable. One significant problem is that the Bank has not directly funded severance pay, often the critical stumbling block in the implementation of a redundancy program.^{7/}

^{7/} See Svejnar and Terrell (1991).

Box 2.1: Railway loans having institutional components in the 1980s and 1990s

Country	Loan	FY	Component Addressed					Remarks
			Private Sector Develop.	Labor Redun.	Perf. Agreement	Change Broad Reg. Policy	Signif. Up-Front Cond'ns.	
Senegal	SEFICS	81	X					Created new, "private" railway
Mexico	Railway Sec	85			X			Initial LAC Perf. Agmnt
Zambia	Railways IV	85	X					
Madagascar	Railways II	86				X		
Kenya	Railways II	87			X			Initial Anglophone African Perf. Agmt
Morocco	PERL	87			X	X		
Gabon	SAL	88			X			
Ghana	Trans Rehab	88			X			
Bolivia	Export Corrid.	89		X	X			Does not address cost of layoffs
Mexico	PERL	89			X			
Sudan	Emerg. Recov	89		X				Suspended, but progress made
Tunisia	PERL	89			X	X		
Zaire	Trans Rehab	89		X				Suspended
Mozambique	Beira Corrid	90	X					
Pakistan	Trans Sec	90		X				Relies on attrition for labor changes
Poland	Trans Sec	90	X					Spinoff of subsidiaries: restructuring planning
Argentina	PERAL	91	X	X		X	X	All services concessioned to private sector
Colombia	PSRL	91	X			X	X	Sell 49 percent to private sector
Senegal	SECAL	91			X		X	
Tanzania	Railway Restr	91			X	X	X	
Zimbabwe	Railways II	91				X	X	
Burkina Faso	Trans SECAL	92	X	X	X	X		Coordination with Côte d'Ivoire
Côte d'Ivoire	Priv Support	92	X	X		X		Coordination with Burkina Faso
China	Railways VI	93			X	X		
India	Container Log	94	X			X	X	Separate corp: shares to be sold to private sector
Mongolia	Trans Rehab	94				X	X	
Uganda	Trans Rehab	94			X		X	
Peru	Trans Sec	94	X	X			X	Concessioning

Source: World Bank reports.

Agreement among the various government agents and attention to macroeconomic and political issues has been facilitated by the increasing tendency to include transport components in non-transport projects; this ensures that issues such as tariff increases, foreign exchange availability or changes in the legal framework are faced squarely from the beginning. Examples of this approach are the Tunisia PERL and the Argentina PERAL.

New Approaches to Implementation and Conditionality

Projects are now beginning to include more details of implementation of reform. For example, beginning in the 1980s, management information systems have been included in numerous projects. The Bank is also assisting governments with the details of components such as labor redundancy programs. In the Sudan, the Bank was instrumental in designing and lining up funding for the staff rationalization fund, and in Zaire the Bank included the purchase of productive assets for laid off workers in project funding. Labor redundancy is also being more squarely addressed in lending in the CEE countries. Attention to such details often requires substantial input from Bank staff during project preparation and supervision.

Conditionality is being increasingly front-loaded as governments are asked to take substantial steps prior to Board presentation or effectiveness. This contributes to improved implementation by forcing the government, and Bank staff, to focus on actions necessary to get the project started, as well as confirming government commitment; it may also prevent lending altogether in cases where that commitment is missing. Sector and other types of loans which are disbursed in tranches rather than against specific expenditures have become the preferred vehicle for conditionality, as witnessed by the most recent projects which contain almost no dedicated railway loans. In the Argentina PERAL, most of the analytical work and preparatory activities, as well as the legal framework and strategic decisions for the restructuring of the railway, were in place before Board presentation. Other conditions included sequential targets for divestiture and closure of uneconomic lines and services that would end all operating responsibilities of the present organization, and the implementation of staff reduction plans. While targets for operational and financial performance still appear in many projects, they are framed in the context of institutional reform, which increases the likelihood they will be achieved.

A series of loans to Colombia illustrates the Bank's toughening stance on conditionality. Beginning in FY53, the first few projects included government agreements to reorganize the railway and improve operations and finances. These met with little success: the railway's performance was poor, there were substantial delays and cost overruns, traffic grew less than anticipated, and financial support from the government was only two-thirds of the expected level. Despite the poor performance, a decision was made to go ahead with Railways VI in FY74 in an effort to defeat the cycle of deteriorated infrastructure, derailments, poor service, and loss of traffic. The approach was traditional, however, and the project did not succeed: the economic rate of return was probably negative. Frequent changes of management and insufficient government support contributed to the failure. Railways VII (FY82) contained two tranches, the second of which was contingent on potential traffic and the success of the first. The mid-term review of the project (1985) concluded that in addition to profound changes in operational and commercial practices, fundamental changes were needed in the relationship between the government and the railway, and recommended that the Bank withdraw from the project unless there was firm evidence of government commitment. Subsequent failure to implement most of the covenants (including financial targets, compensation for unprofitable services, and reduction of passenger services) led to cancellation of the loan in 1987. Meanwhile, a study carried out near the end of the project and

later adopted by the government laid the groundwork for a radical restructuring of the railway. The Public Sector Reform loan of FY91 included, as conditions of Board presentation, the completion of plans to dismantle the railway monopoly and the initiation of efforts to attract private participation in the new rolling stock company. Actions under this loan have now progressed to the point where the first private train operator (a coal company) is preparing to commence operations on the publicly owned right of way.

Results of Some Recent Railway Loans

Recent experience is showing that change is possible, and that the Bank can be instrumental in the reform process, but it takes time, resources, and continuity in Bank effort. The challenge to Bank lending now is to assist in restructuring the railway, including its relationship with the owning government, so the railway can find a rational market and social role. The form and degree of restructuring, and the Bank's role in it, vary among countries, and depend on the context in which the railway operates. For example, market-oriented reforms in the economies in transition will absorb a substantial share of Bank railway lending and advice in the next few years. A few detailed examples illustrate the advances, albeit uneven, that have taken place.

Kenya. Although most projects now address the problems raised above, they have not yet found the perfect solution to them. A common problem is that the reforms may take place on paper but, for one reason or another, not in fact. Kenya furnishes a clear example of the way in which otherwise technically competent documents can fail in practice. Preparation of Kenya Railways II (FY87) included agreement on an action plan, a corporate plan, and a performance agreement to define mutual obligations of the government and the railway. In April 1989 Kenya Railways (KR) and the government signed a Memorandum of Understanding (MOU), spurred by KR's desire for more freedom of action and a plan on the part of the Bank to strengthen KR's financial position and improve its management. Based on a comprehensive, longer range corporate plan, the MOU adopted the principle that the railway is to operate on "commercial" grounds except where the government pays compensation for services that are non-commercial or unproductive. The other terms of the MOU, defining the principles of cost calculation and provision of foreign exchange, among others, appear to be workable and comprehensive. The MOU and related plans would be a useful model for Bank use elsewhere.

Unfortunately, the appropriate government officials either did not understand the MOU or could not ensure that the government would live up to its responsibilities. The finance ministry approved of the idea that the railway should be self-sustaining, but the bill for social services was unpalatable and has never been paid in full, although partial payments have been made for commuter services and for delays in tariff approval. At the same time, KR did not at first aggressively pursue its authority to act commercially. The end result was a potentially useful agreement which was simply not well implemented.^{8/}

It is not clear why the Kenyan government did not live up to the terms of the MOU. One strong possibility is that the government approval may have been partial, based on Finance Ministry approval of the financial autonomy objective, and Ministry of Transport acquiescence, but without higher

^{8/} In general, performance agreements appear to work best in firms that have already been rehabilitated; they have not been very successful at restoring basic health to enterprises. Results in developing countries have often been disappointing. See Nellis (1988).

political understanding of the PSO obligation, and without appropriate political approval and support of the implied policy changes in a number of sensitive areas such as reduction in KR staffing. Another possibility is that the plan and compensation formulae were sufficiently complex and ambiguous that the underlying issues were at least partially concealed by disputes over the details of the plan. Because of their intimate knowledge of the railway and their long service, the railway officials may have understood the issues far better than their government counterparts: the difference in sophistication may have led to inadequate explanations by railway officials, and may even have been perceived by government officials as deception. At the same time, KR may simply have been too far ahead of other Government parastatal enterprises in seeking autonomy, and suffered accordingly from the problems of breaking new ground. In addition, KR's Managing Director was changed abruptly for reasons unrelated to the MOU, but the ensuing disruption caused delays in implementation of the MOU. For whatever reasons, the process of development of the MOU did not lead to complete understanding by government officials at a high enough level to ensure implementation, nor was the government prepared to make the harder decisions when they became clear. After intensive discussions at the end of 1990, however, including the real possibility of suspension of the loan, the government accepted the MOU and began to support its implementation, and KR began to take advantage of the commercial opportunities available. Though final results are not yet available, there is reason to hope that the MOU will be at least partially implemented and have positive results.

Mexico. By many standards of comparison, the Mexican railway (FNM), as shown in Tables B.1 and B.2 of Annex B is one of the more effectively operated railways in the developing world. FNM is a freight-oriented carrier with a significant role in Mexico's freight transport system. It has also consistently generated deficits in the US\$500 million range (roughly 0.3 percent of GDP), and its operating ratio has rarely fallen below 150 percent. The initial attempts to bring the financial problem under control, by redefining the relationship between FNM and the government, came in the form of a "Convenio," the Mexican equivalent of a performance agreement, signed in 1985 as a condition of the Railway Sector loan. This Convenio attempted to define the respective goals and responsibilities of the two entities. It contained a number of specific performance goals for the railway, as well as a capital target for the government.

The initial Convenio suffered from the same problems as the early French enterprise contracts: it was overly legalistic and mechanistic, and it was not based on a clear definition of the objectives and authorities of the railway. In some ways, in fact, the output measures had the potential to be mutually contradictory or inconsistent: a tonnage commitment, for example, can easily be met by hauling heavy commodities at low rates—but this could easily conflict with a financial objective. Further, an objective like "break even" would be useful so long as there are "deficits"; after break even is achieved, however, the objective would offer no additional guidance as to how the net income is to be used (i.e., should investments be increased, or should rates be reduced in order to keep performance at break even?). The first Convenio also left several critical issues undefined, including the railway's role in marketing (the rate structure was to be fixed by the government, subject only to a requirement that revenues cover variable costs). Aside from its value in initiating a more productive dialogue between government and railway, neither party was particularly satisfied with the results. The second Convenio was signed in 1987 and the third in 1989. Although each addressed a perceived problem in the earlier agreements, they became progressively vaguer, removing certain targets, such as labor productivity, without clarifying earlier ambiguities.

The Convenios did not notably improve railway performance. In fact, FNM rarely met any of the quantitative targets established in any of the Convenios. It is unfair, of course, to blame the Convenios. The causes of the problem may be as much revealed by the vague nature of the Convenios as resolvable by them. The fundamental issues appear to have been:

- The government remained unwilling or unable to say clearly what it wanted the railway to do, nor would it leave the railway alone to do it. The language became clearer that the railway's important role was to be in the freight field, but incentives and authority for the railway to eliminate losing services, either by abandonment or by price increases, were generally absent and notably ineffective. In particular, the railway's rates for freight and passenger remain completely regulated, and may not be changed without permission.
- FNM did not receive an adequate subsidy for imposed services, although it was acknowledged in Mexico that passenger services generated deficits, and that delays in approving rate increases caused the deficit to rise. It was the intent of the earlier Convenios that such support payments be identified and paid in full.
- The Convenios were lacking in a detailed definition of the railway's future plans, market by market and function by function. It was and is thus difficult to put the projected deficit targets and capital budgets into any kind of normative context. When unexpected events occurred, such as an increase in inflation or other economic disturbance, there was no guidance as to how to correct the targets, and why.
- The remaining performance objectives contained confusing, irrelevant, and even potentially perverse incentives. For example, there was a potential tradeoff between tonne-km and deficits because, to some extent, increased tonne-km can compensate for increased deficits in the weighted performance measure. Also, for a given deficit level, the manager was encouraged to generate maximum tonne-km which, depending on the perceived interaction between traffic and costs, could well have led to maximized traffic in the short run followed by increased track maintenance in the longer run—after the current management had received its incentive payments. It could also have encouraged track maintenance expenses to be shifted into the rehabilitation account, for which the government paid separately, and for which the manager was given an additional incentive to complete expeditiously. Perhaps most important, the performance measures guaranteed the continuing interference of governmental supervisors in matters which are best left to railway management. For example, it is hard to see why the government should concern itself with locomotive availability levels. A proper measurement of deficits would subsume this measure in costs (and revenues): why count it twice, or involve the government in an issue over which it has no competence or direct control? When both government and railway are involved, neither is responsible.

Basically, the Convenios in Mexico suffered from a lack of decision by the government and acceptance by FNM, of a valid and clear role for the railway. This prevented the government from agreeing to clear and simple financial targets and made it harder to leave responsibility for operational performance to FNM.

After the recognized failure of the Convenios of the late 1980's, a different approach to resolving the financial and performance problems of the railway was implemented. In 1992, FNM proposed a far reaching Plan for Restructuring, which included measures designed to reduce costs and improve performance. The Plan, which was accepted and supported by the railway union as well as the federal government, has already resulted in voluntary staff reductions of almost 30 percent (more than 25,000 employees) financed by the sale of surplus railway land, substantial modifications to the labor agreement, the introduction of modern management and operating practices and the concessioning of activities not directly related to the operation of trains. The result has been a dramatic improvement in most operating indices, but so far the cost of financing staff retirements has prevented any improvement in the financial results.

A new Convenio, prepared in 1994, would transfer out of the railway account all costs not directly related to operating a commercial railway; these include unfunded pension obligations, debt payments and the cost of environmental clean-ups. The government would make specific payments for unprofitable passenger and freight services that it required the railway to operate for social reasons. The trade off would be that from the end of 1995, the railway would not require any other payments or transfers from the Treasury, and all investment would be financed from private sources, concessionaires and contractors, or directly by FNM from its own resources. Final agreement on this Convenio is awaiting the outcome of a review of possible, more fundamental changes in the government's relationship with the railway.

Uruguay. In some cases the Bank has been instrumental in helping to put together the information and the tools needed for carrying out reform even when its efforts did not directly result in a railway project.^{9/} Uruguayan Railways (AFE) was an almost prototypical "railway problem".^{10/} It had suffered greatly from a loss of traffic to highways, and by the early 1980s AFE had become primarily a passenger carrier,^{11/} although its role in both freight and passenger markets was marginal at best. AFE generated large annual losses (0.3 percent of GDP) and in 1985, the year that major change became fiscally unavoidable, wages alone amounted to 340 percent of total revenues. Worse, traffic trends were such that the losses were destined to become greater, not less.

The need for change at AFE had long been a matter for discussion between the government and the Bank. Preparatory studies of AFE's operations had been completed, but no action had been possible. AFE was a proposed component of Transport I when the government decided in 1987 that it was politically too sensitive to attempt change at AFE, if the Bank were seen to be involved. The government elected to remove the component from the loan and implement a program independently. The government then abolished all passenger services and cut AFE's labor force by slightly more than 50 percent. There were three reasons why this program made progress. First, railway reform was one of the signature initiatives of the newly elected Sanguinetti Administration. The Administration considered

9/ In recent years, there have been several other instances where, though no Bank lending was involved, governments have requested and received Bank assistance in initiating railway restructuring programs. These programs may ultimately lead to Bank loans.

10/ See Kohon and Thompson (1989), for details.

11/ See Annex B, Tables B.1, B.2, and B.3.

the change to be important for fiscal reasons, and appointed energetic and competent officials, with the confidence and support of the President, to implement the program. Next, the actual demand for passenger service was indisputably low, even at the low prices being charged (on-train studies had indicated that as much as 40 percent of the passengers on the train were railway employees or other free pass riders), and the cost of providing the service greatly disproportionate to the benefits. Third, the government took a very sympathetic stand toward the concerns of the labor unions. In fact, virtually every employee associated with the change was successfully helped to find another job at least the equal of their job before the restructuring; employees being dismissed from the railway continued to receive full pay until another job was found. This was, however, only part of a complete solution. Although one major problem, passenger losses, was resolved without significant disruption, it is less clear what the company's freight role will be, nor is it clear what shape the institution will take to fill its future role.

Pakistan. A potentially significant Bank railway institutional reform loan is the Pakistan Transport Sector project (FY90). The Bank has had a long history of rail lending to Pakistan, most of it technically-oriented and conventional, with limited impact on the institution. As Annex B, Table B.2 shows, despite 11 Bank loans, Pakistan Railways (PR) does not compare especially well with other railways of similar size in the region. The most recent transport sector loan to PR takes a more ambitious approach. The objective of this loan is to obtain as much favorable institutional change as feasible, in return for financing of selected capital items which, *inter alia*, are aimed at supporting that institutional change. The loan is based on a detailed corporate plan developed by PR, with staff support provided by the Bank, designed to make PR a more nearly self-sustaining commercial organization. The result is a comprehensive and reasonably credible corporate plan which is the property of PR itself and not a poorly understood consulting product. Also, initial moves toward a market-based organization are planned.

While these changes are encouraging, it is too soon to tell whether they will be implemented as promised, especially because the government changed after the loan was negotiated. Some issues remain unresolved. First, although the railway is expected to operate on commercial lines, the government has not demonstrated its actual willingness either to pay the deficits of losing services (primarily short haul passenger trains), or to allow them to be closed. If this is not done, the credibility of the process will be greatly reduced. Already, effectiveness was delayed because a number of conditions, including the creation of a structure more compatible with commercial orientation, were not met. Second, although the railway is to have more freedom in determining costs and setting tariffs, government policies in regulating other modes and in choosing methods of shipment of its own commodities have not been adjusted. Finally, as mentioned above, the railway's treatment of labor redundancy still lacks authority and commitment.

Senegal. Another project that holds promise for successful reform is the SECAL in Senegal. Senegal was one of the first countries to attempt the use of performance agreements, instituting at least five in the early 1980s. One of these was with the railway, undertaken with the encouragement of the Bank. The government failed to carry out its commitments under the agreement, largely because it did not allocate the resources it had promised. The reason, according to Nellis, was simply that the government did not have the administrative capacity to coordinate all of the agreements being signed to ensure that it could meet the sum of all commitments, and not just the commitments of any one agreement. The failure underlines the fundamental point that an agreement cannot be implemented if the

parties do not fully understand it or are unable to carry through on their obligations.^{12/} Since 1989, as part of project preparation, the railway has been transformed from a Régie Nationale to a Société Nationale (which, at least in law, gives the railway managerial and financial autonomy similar to that of private enterprises); it has been given the mission through a new "Cahier des charges" to act commercially and without subsidy (and is doing so), subject to compensation for non-commercial services; a commercial department is envisaged to enhance commercial orientation, and the new tariff autonomy over both passenger and freight fares has been exercised a number of times without government intervention; government regulation of transport has been modified to improve competition among the modes of transport; a new personnel statute has been adopted which will facilitate the process of removing labor redundancy and improve management control over the railway through improved performance incentives and promotion procedures; and, a revised enterprise plan is being prepared to serve as the basis for projections of performance and capital needs. During the course of these reforms, a performance agreement confirming the new railway operational and financial objectives was signed. Implementation by both government and railway will be monitored through tranche release conditions in the SECAL.^{13/}

Tanzania. Tanzania Railways Corporation (TRC), like many African railways, has not fared well over the past decade as competition has grown and the railway has had to survive with limited financial resources and a government/railway relationship that did not foster managerial autonomy at TRC. In the FY91 Railway Restructuring Loan, the Bank and TRC established the objective of clarifying the relationship between government and railway, and promoting the relationship between TRC and its customers. This loan has not proceeded smoothly, and progress has only recently begun to be made. TRC has made progress in carrying more traffic, but this has been partly because of new locomotives (and not because of better repair of the existing fleet). The required Memorandum of Understanding (MOU) was developed, but has been slow in implementation because of the difficulty (as in other MOU's) of measuring and enforcing compensation for PSO services. The Bank and other donors have worked closely with TRC in implementing the MOU, and will continue to work with TRC and the Government of Tanzania in developing an agreed definition of the level of PSO payments required. This appears to be as much a problem of training as political will.

Côte d'Ivoire and Burkina Faso. The Bank is working with these two countries to implement a program of concessioning the railway to a single, private sector operator. Although it did not participate in the development of the bidding documentation, the Bank has assisted in development of the concession agreement with the agent chosen by the two governments, and will assist in implementation of the concession. The governments have chosen a concessionaire (a joint venture among Ivoirien, Burkinabe and French investors), and have been engaged in final negotiations; the negotiations were complicated by the devaluation of the CFA Franc, and it is not yet certain that they will have a successful outcome.

12/ This would be particularly true when, as is usually the case, the government cannot be successfully (or safely) sued for specific performance under the agreement. Anything less than full understanding and agreement on the part of the government is a recipe for non-compliance.

13/ See Budin (1990), produced under the Sub-Saharan Africa Transport Project, for details and a discussion of railway restructuring in Africa.

Argentina. Another important project involves increasing the role of the private sector in Argentine Railways (Ferrocarriles Argentinos, or FA)^{14/}, which offered an extreme example of the problems facing many countries' railways: lack of a marketing or commercial orientation, a bloated labor force which was politically untouchable, prices restrained by government intervention, inability to maintain rolling stock because of a lack of management attention, and misplaced capital spending priorities which emphasized passenger (especially commuter services) over freight. FA carried only 10 percent of the nation's intercity tonne-km, and 8 percent share of intercity passenger-km (in competition with autos and a flourishing, privately-owned urban and intercity bus system). FA's suburban services in the Buenos Aires area were significant, but it cost around US\$200 million per year to perform a role which was smaller than the role of privately-owned, commuter buses. The total financial deficits of FA ranged between US\$600 million and US\$1 billion in recent years, an amount which was about 1 percent of GDP, and about 9 percent of the entire public sector budget. FA's traffic in all markets was falling because it faced competition from privately owned trucks and buses, and because the quality of its service was generally poor.

The Bank had several loans to FA for the traditional purposes of rehabilitation. The most recent railway loan (Railways II, FY79) had 30 percent of the funding canceled because implementation was extremely slow and because of government non-compliance with restructuring conditions relating to tariff flexibility, PSO subsidies and line closures. Against this backdrop, the Bank began sector work in May of 1987 to explore the possibility of additional progress in restructuring.

The initial approach concentrated on restructuring FA within government ownership and operation. Although many of the Bank recommendations were accepted in principle by the government (but not the railway), no action was taken, and loan preparation did not progress. In the summer of 1988, the Argentine government (under the then President Alfonsín) established a study group to initiate privatization of the various functions of FA, the general approach being to lease or franchise FA assets to the private sector to operate. The Bank was asked to participate in the deliberations of this group, and did so. Unfortunately, the progress of the discussions was severely impeded by the resistance of the railway and the "lame duck" status of the Alfonsín government: no actual progress was made, although the pressure on FA to improve its management did succeed in reducing its deficit.

The Menem Government made restructuring and privatization of the major public enterprises a high priority, with privatization of FA at the forefront of the program. The Bank was deeply involved with the Government in developing a program of institutional reform, with financing through two loans, a Public Enterprise Reform Adjustment Loan (PERAL) and a Public Enterprise Reform Execution Loan (PEREL), both in 1990. The loans had several facets. FA's commuter services and facilities were separated and immediately placed in a new public authority (FEMESA) which was given the responsibility of developing and awarding franchises for operations to the private sector. These franchises have now been awarded, and operations have commenced. Most of the remaining FA assets were divided into contiguous franchises for freight operation by the private sector. Of the six potential freight franchises, five have been awarded competitively and are now in operation. The remaining potential franchise (the Belgrano—the meter gauge railway in North and Northwestern Argentina) has been problematical, primarily because it is highly uneconomical to operate in its predominantly mountainous, sparsely populated territory. A solution will eventually be found, but the priority has been placed on finishing

14/ See Baigorria and Sotack (1992), Judge (1993), and Kogan and Thompson (1994).

the other transactions first. Virtually all of the intercity passenger operations were closed. One possible passenger franchise, Buenos Aires to Mar del Plata, is still under consideration for support by the Provincial Government of Buenos Aires. The government has lifted virtually all regulation on general freight tariffs, and has ended regulation of contract tariffs. Most surprising of all, the labor redundancy program indirectly financed by the Bank has progressed well.

It is very clear that a lot of progress has already been made. Although significant questions of implementation remain, the FA reforms, if carried out as committed, will be a remarkable innovation, transforming what has been a major fiscal problem into a much smaller system which, for significant shippers, could perform a useful service. Deficits and inefficiencies of suburban passenger services, as well as benefits, will be evaluated and paid by the direct users. Excess labor (about 65 percent of FA's labor was *not* retained by the new concessionaires) has been released with fair compensation.^{15/}

Poland. The Bank has been working under a Transport Sector Loan (FY90) which was negotiated before the Polish transition to a market economy began. While continuing to support the investment components of the original loan, the Bank has shifted its emphasis toward helping the railway (PKP) in identifying the steps needed for finding PKP's new role; this has become especially imperative because the fast falloff in rail traffic combined with rapid cost escalation has seriously undermined PKP's economic viability. With Bank help, the government has set up a Transition Committee which has brought together all interested elements of the government to oversee the broad strategic planning process now underway. A great deal of progress has already been made in reducing the labor force and in identifying the broad direction of change (including the need for separate profit centers for various lines of business, and the need to create a larger role for local authorities in planning and funding suburban passenger services); within the next year the government should have in hand a more detailed plan for implementing change.

Hungary. A similar process is underway in the Transport II loan in Hungary, also because the reduced role of the Hungarian State Railway (MAV) has made restructuring a near-term necessity if the railway is to remain financially solvent (and comply with financial conditions of the loan). Similar transition lending is under consideration in most of the Central and Eastern European railways to which the Bank (and the EBRD) are making loans.

China. The Chinese government has begun its own approach to the issue of railway institutional change as the socialist market economy takes shape. Beginning in Railways V, and emerging further in Railways VI (and the potential Railways VII and beyond), the issues of an improved railway/government relationship and experimentation with market-driven railway organizations have come to the fore. While it is clear that no organization as large as MOR can (or should) be changed rapidly, the need for institutional change, the broad direction of that change, and the role of the Bank as a partner with MOR in identifying options for change has been fully accepted. In fact, the evolving relationship between the Bank and MOR—progressing from purely technical to broader institutional issues—is a good example of the typical stages of the Bank's relationship with the larger railway enterprises.

^{15/} For other examples of the issues of excess labor in developing country railways, see Svejnar and Terrell (1991), and World Bank (1989).

Experience in developing countries shows that change in the right direction is possible. By themselves, developing countries are too limited a sample: there is also valuable experience available in developed countries which adds to an understanding of what works.

RAILWAY RESTRUCTURING EXPERIENCE IN DEVELOPED COUNTRIES

Impelled by the knowledge that the costs of continuing inaction were even higher than the pain of reform, many governments in developed countries formulated during the 1970s and 1980s a new approach to their dealings with public enterprises based on questioning the purpose of the enterprise, clarifying the roles and responsibilities of the government vis-a-vis the enterprise, and then considering the appropriate new regulatory and institutional framework. Decentralization, introduction of corporate management principles, and, more recently, a larger role for the private sector were the instruments considered. Implementation of these programs usually required substantial liberalization measures and regulatory change. In the process, a great deal of progress was made and much useful experience was gained in the developed countries which was available for application in developing countries. This chapter summarizes that experience in the railway area. The ensuing chapter discusses the lessons to be absorbed from the experience of railway reform in developed and developing countries.

The discussions and analysis in "The Railways Problem" could easily have been aimed as much at developed country railways as at the railways in developing countries. The primary difference in railway issues in the two areas was the size of the problem: the railway-related financial drag and institutional challenge in the *developed* countries was much larger, with some railways experiencing annual losses of as much as US\$13 billion.

The root of the problem in the developed countries had become well-known: a change in transport markets, especially a shift of freight from rail to truck and of passenger traffic from rail to auto, air and bus, eroded the railways' markets. The tradition bound, labor dominated and rigidly-managed railways were simply unable or unwilling to adapt.

The manifestations of this problem were also common to all of the developed, and developing, countries. There was a significant loss of traffic, particularly freight, but also longer haul passengers, to other modes. Railways were forced to provide unremunerative social services, such as local passenger services and low density branch lines. They also operated under imposed rates and tariffs, such as student discounts or rates for agricultural commodities, which were well below cost and for which no offsetting compensation was paid to the railway. Excessively large labor forces were imposed by law, regulatory practice or social policy, resulting in both an unnecessary financial burden and a managerial problem. In some ways most important, government financial support and regulatory interference had encouraged a railway focus on the production side, without regard to actual market needs.

The inability or unwillingness of the railways to respond led to a series of financial train wrecks which eventually captured the attention of the national governments involved. Although there are differences in the experiences of each of the countries, resulting either from the timing of the crisis which developed or from national circumstances, there are remarkable similarities across all countries in all economic situations. The discussion below briefly summarizes the developed country experience, some of which is described in more detail in Annex A.

The United States

The U.S. railway system, which had always been privately owned and operated, experienced a long decline with the advent of highway competition. The damage done by the decline was aggravated by a hostile, backward-looking system of regulation which attempted to force the railway companies to cross-subsidize social services (passenger and rural freight) through high rates on higher valued merchandise. By the early 1970s much of the U.S. railway system was in, or near, bankruptcy.

In response, the U.S. Government took three broad steps: creation of Amtrak (the nationally-owned and funded intercity rail passenger carrier); nationalization, reorganization and subsequent privatization of seven railways in the Northeast region of the U.S. (all were combined into a railway now called Conrail); and substantial deregulation of the transport industry. These actions accomplished several major purposes: Amtrak removed the burden of passenger deficits from the private railways and placed it as a separate and explicit item in the federal budget where those demanding passenger services were required to justify it; the creation of Conrail removed a series of uneconomic operations and labor practices from the shoulders of the private railways; and thorough regulatory revision permitted railways (and trucks) to adapt services and rates much more closely to the needs of customers. The result is a more efficient and dramatically healthier rail industry and better service to users.^{16/}

The United Kingdom

The British rail system faced many of the same problems as the U.S. after World War II. The initial British response was to nationalize its railway system, creating British Rail (BR). Nationalization failed to solve the problem for several reasons, of which the most important was the combined effects of the shift of traffic from rail to truck resulting from the ending of wartime traffic restrictions and the growth of truck competition. The British government came to realize that adverse policy and regulatory decisions were expensive and had to be paid directly by the government as owner and operator.

The government responded by deregulating BR, by giving BR a set of physical and financial objectives (although these objectives required years to be refined), and by substantially deregulating trucking. In the ensuing years, BR concentrated more and more on clarifying its role as between its commercial (unsupported) businesses and its Public Service Obligation (PSO) activities which were always recognized as needing public financial assistance. The relationship was governed by an understanding between BR and the government which provided essentially that BR would be free to manage its business, in return for a targeted reduction in public funding requirements.

BR organized itself into five separate business sectors ("profit" centers): freight (unsubsidized and unregulated); intercity passenger (unsubsidized and unregulated); Provincial Services (commuter and light density services which are regulated and subsidized); London and Southeast (commuter services regulated and subsidized); and, parcels (unregulated and unsubsidized) and other corporate activities, such as real estate development, which are unsubsidized and unregulated. Subsidies are paid through the PSO grant, a budgeted set of payments to cover the losses associated with providing services which are unprofitable. Overall, despite the trauma of the managerial culture change involved in converting from

^{16/} See Thompson in Carbajo, ed. (1993), pp. 31-44.

a production to a marketing-oriented railway, BR appeared well along on the road to self-sufficiency in the commercial areas, and had developed a clear, agreed and effective role in the PSO areas.

Then in mid-1992, the British Government issued a white paper detailing a policy for shifting parts of BR's services to the private sector. The government's basic intent is to place most of the railway's fixed facilities into a new organization which will own, maintain and control access to the track. The organization will charge for track use, and may eventually be privatized. A number of operating companies will be formed and sold as franchises to the private sector. Profitable franchises will be awarded on a least price basis; unprofitable franchises, such as suburban passenger, will be awarded for minimum subsidies needed. While it is not clear how these policies will be implemented, it is certain that major changes will continue.

France

There are many parallels among the railway developments in France, the U.K. and the U.S. France went through a period of financial and managerial dissatisfaction with its public enterprises, including the national railway (Société Nationale des Chemins de Fer Français, or SNCF). In 1967, the Nora Report recommended the development of formal agreements between government and enterprises specifying clearly and in detail the objectives, authorities and responsibilities of each. The purpose of these agreements was to reduce the confusion as to the role of the enterprise, to reduce government interference in affairs for which management was to be held responsible, and to make it possible to hold management accountable for meeting objectives.

These "contrat plans" (performance contracts or performance agreements) have gone through a long process of evolution, starting from agreements which were too detailed and inflexible. In later agreements, SNCF and the government have placed greatly increased emphasis on the *planning* aspects of the relationship, and have viewed the "contract" phase as a relatively mechanical process of implementing the plan. The *process* of developing the plan has vastly improved the amount and realism of communications between government and railway and, because it has clarified responsibility and authority, it has significantly improved the ability of SNCF to make decisions—and thus of the government to hold SNCF accountable for those decisions. By defining capital and operating assistance explicitly by purpose, performance agreements have also greatly clarified the PSO function of the railway.

At least until recently, however, the performance agreement process probably made more actual progress in refining the relationship between railway and government than it did in changing the underlying corporate culture of SNCF as a government-led agency; and the early agreements did not make sufficient progress in introducing significant market-related influence on SNCF decision making. In the later agreements, however, these factors began to receive much more attention, and SNCF has recently announced a reorganization which is quite similar to that of BR in its focus on market lines of commercial activity rather than primarily on operating considerations.

Sweden

The forces leading to railway restructuring in Sweden appear to have been: relatively poor financial performance; a concern for perceived inequities in the financing of the infrastructure as between highways and railways and a desire that the perceived environmental benefits of railways in urban transport be adequately evaluated; and, a belief that the monolithic railway structure was restricting the

emergence of market-oriented operating activities. In response, the Swedish Government split the former railway into two parts, a railway administration which will own and maintain the fixed plant and charge operating authorities for their use of the facilities, and an operating company which will pay for the use of fixed facilities and focus on a commercial approach to serving customers. Provision has been made for allowing several competing operating companies to emerge but, except for one metropolitan area which has chosen to operate its own service, operations remain unified.^{17/}

The results of the Swedish experience are still emerging. In particular, the problems of conflicting and competitive use of the same tracks have not yet been encountered or resolved because there is still only one significant operating entity. Evidence is emerging that the split between operations and fixed facilities *is* causing problems related to the cost, planning and coordination of track maintenance. It is clear that the operating company has chosen a line of business organization along lines similar to that of BR, and that real strides have been made in improving operating productivity and financial performance.

The Swedish experience has been mirrored on a larger scale by the Directive of the European Community that the books of account for all EC railways should be divided into right-of-way departments and operating/marketing enterprises, and that open access should be provided to all railways on a non-discriminatory basis. The impetus for the proposal appears to be much the same as in Sweden, i.e., a desire to put the railway and highway modes on a "fairer" competitive basis, and a desire (less clearly articulated) to shake up the current monolithic railway structure.

Japan

Much like railways in other countries, Japanese National Railways (JNR) gradually shifted after WWII from a mildly profitable position to literally staggering annual deficits (US\$13 billion in 1985) by the mid 1980s. Beginning in 1969, four attempts were made to get control of the JNR deficits, all with no results, because of political interference, a lack of a sense of crisis, and bureaucratic inertia. Deficits continued to mount, and change became imperative.

The former JNR was divided into a number of new government-owned corporations, including: six geographically based passenger railways; one freight railway which operates over the trackage of all of the passenger railways, and pays a fee for doing so; the Shinkansen (Bullet Train) Leasing Corporation which owned the high speed right-of-way and leased it back to the passenger railways; and, the JNR Settlements Corporation to carry the burden of the unapportioned, unfunded obligations of the old JNR.

The first five years of operating experience are quite positive. The larger passenger companies are, in fact, earning higher profits than originally projected, and the smaller companies are generating manageable deficits well within the original targets. In the aggregate, the profits of the operating railways have increased from a loss of US\$3.2 billion in 1986 to a positive US\$4.7 billion in 1991. Consolidated annual losses for the overall group have been reduced by over US\$10 billion. Plans for "privatizing" the larger companies are proceeding and half of the stock in one of them (East Japan) was sold to the public in August of 1993; the offering was far oversubscribed. However the financial results turn out, the program must be judged a success in reaching the underlying objective, which was to change the

^{17/} See Moyer and Thompson (1992). See also Sicking (1991) and Larsson (1991).

mentality of the railways—to give them a reason to operate rationally and efficiently, to give better service to passengers and to stop running up huge losses.

Other Countries

Many other countries in the developed world have undertaken restructuring programs. New Zealand, in particular, has completed a thorough review of its railway and of the need for change. The result was a dramatic change in the size of the railway's labor force (down by 55 percent while traffic fell only 20 percent) and deficits. New Zealand also changed its system of transport regulation in order to permit a new modal balance to emerge in line with the revised railway policies. The railway was ultimately sold in its entirety to the private sector in the summer of 1993. Australia is now in the process of a similar change. Denmark has reorganized its railway to emphasize market needs, and Finland has recently completed a reorganization of its railway along market lines. RENFE, in Spain, has undergone a thorough transformation based on a line of business organization which appears, thus far, to be quite successful. Deutsche Bundesbahn (DB) has completed a plan for the future of the railway over the next 20 years, aimed at introducing a market-based organization. Canada created VIA in 1977, a rail passenger enterprise which is a rough equivalent of Amtrak in the U.S. VIA has had a troubled history, and has recently undergone a major reduction, but it has achieved the primary objective—getting the freight railways out of the passenger business and its related losses.

4

LESSONS FROM RAILWAY RESTRUCTURING EXPERIENCE

Lessons From Developed Country Railway Initiatives

It is always dangerous to generalize across countries, especially for railway issues. This said, there *are* some clear, common elements of all of the railway initiatives in the developed countries, the more important of which are discussed below.

Clarification of Function. All of the successful restructurings separated, in varying degrees, market-driven activities from PSO activities. All then proceeded to encourage the railway to take a commercial approach to the market-driven activities in competition with other modes, and had the government assume the responsibility for defining the scope and funding the PSO activities.

Line of Activity Organization. Reform programs implemented an organizational structure oriented to lines of business. In the case of the U.S., Canada, and Japan, this involved the actual institutional separation of the various enterprises among freight, intercity passenger, and suburban passenger. The Swedish case involves a physical separation of right-of-way from operations, as will also be the case in the U.K.. In France, Sweden, and the U.K., the various market segments (freight, intercity passenger, suburban passenger, and other) are the responsibility of separate, internal profit centers.

Effective Incentives and Authority. Because of the new organizational structures, clarified roles between railway and government, and the increasing importance of *financial* goals (rather than the traditional output-oriented goals), railway managements feel much more able to make decisions toward goals they understand and support. Given adequate compensation for imposed services, and adequate flexibility in competitive markets, it has also been fair and realistic for governments to demand increased accountability.

Parallel Changes in Regulation or Other Government Intervention. In all cases, the change in railway goals and authority was accompanied by an appropriate modification of the system of regulation or other government intervention. Among other things, this reduced or eliminated controls over rate-making and line abandonments, and either eliminated the cross-subsidization of PSO services or forced government agencies to pay explicitly and fully for imposed services. Railways were given much expanded freedom to set tariffs for commercial activities.

Removing Major Barriers or Burdens. Before restructuring, all of the developed railways carried large economic burdens which were the result of past railway or government policy or inaction. For example, the U.S., New Zealand, and Japan found it necessary to reduce the labor redundancy which had crept in over the years as a result of poor railway decisions compounded by government interference. Redundant labor was offered fair compensation in the form of preferential access to other jobs or severance allowances and retraining, among other programs.^{18/} The force reductions since 1980 ranged between 30 percent and 60 percent, and the performance of the enterprises has improved accordingly.

18/ See Havlicek (1988).

BR and SNCF have seen staff reductions (primarily through attrition) of 30 percent and 13 percent respectively since 1980. Although the most important, labor was not the only barrier to change: on the day of Amtrak's formation, about 50 percent of the U.S. intercity rail passenger service was terminated. The trackage system of Conrail has fallen by about 30 percent. In many cases, also, enormous debts or other obligations (retirement liabilities) were removed because the new enterprise simply could not be expected to carry them and because the debts had, at least partially, been caused by misguided government policy.

The Civil Service. One of the more difficult political problems concerned the role of the civil service, or its equivalent, in the reform of the railway. The employees of Amtrak and VIA are not public employees, and can be hired, fired or paid (except for the highest levels) exactly as in the private sector. The same is true of the new Japanese railway companies. BR has similar flexibility, except as to pay. One of the major constraints on the ability of Germany's DB to implement its proposed plans is the fact that a major part of the DB work force has been in the civil service. The essential problem, as most of the countries have realized, is that survival of the railway is more and more related to its ability to compete in a market demanding higher performance, and in competition with a private sector which is not subject to civil service limitations on management flexibility. Reform of the public personnel statutes is thus a key component of a program to make railways more market sensitive.

Public Participation. Another common element in many of the programs was the use made of reports by authoritative and impartial persons or bodies outside the government and railway. The process in France began with the Nora Report (1967) and was enhanced by the Guillaumat Report (1978). The BR restructuring was critically influenced by both the Beeching and the Serpell Reports. The entire process of the formation of Conrail was entrusted to an independent, ad hoc agency called the U.S. Railway Association (which was publicly funded, but which functioned as if it were privately owned—the employees were not civil servants). The Japanese initiative emerged from the report of the Second Ad Hoc Commission on Administrative Reform. There can be no question that railway reform is a painful and contentious process: real benefits were gained from entrusting the planning and definition of policy choices to entities which were professional and impartial. The ensuing open debate over the reports played a significant role in assuring all parties that defensible assumptions had been used, the right questions asked, and the choices, however painful, fairly made.

Lessons From Developing Country Experience

Many of the lessons from developing railways are the same as for developed railways, as discussed above. Some issues, such as clarity of function, line of activity organization, effective incentives and authority and removal of various barriers to efficient operation, are actually general principles of good management which the *developed* railways and their governments should not have had to reinvent for themselves. It is a fair measure of the difficulty of the process that the obvious solutions can be avoided or rejected for so long, even (or especially) in the developed countries. There are, however, some facets of the developing country experience, as discussed in Chapter 2, which are distinct and are of particular importance in designing Bank projects.

Government Capacity to Understand and Implement. Railway restructuring is not simple. A good strategic plan, and the agreements to implement it, are sufficiently complex that most developed countries and their railways failed the first several times they tried. Time, resources, and a great deal of local involvement are needed if the process is to work. The most recent transport loan to Pakistan

appears to have benefitted from a recognition of the need for ensuring government participation and understanding.

The Need for the Highest Level of Government Involvement and Approval. It is never enough to get agreement only from the railway to undertake the process of change, nor from the Transport Ministry, nor the Finance Ministry. Where the process has worked, it is because the highest political authority of the country understood the need for change and gave the program a high political priority. The reason is simple: railway reform always has political implications for labor and for various regional and economic interests, and only the chief executive can make the requisite commitment to resolve the ensuing conflicts.

The Bank Cannot Impose Railway Restructuring. The Bank may well be able to insist on a particular resolution of technical questions, but railway reform requires far too much commitment and sustained effort on the part of local parties for it to reach completion just because it is a condition, however important, in a loan from the Bank. Either the local government *affirmatively wants, understands and pursues* the change, or it will not happen. The Uruguay case is significant in that, having taken the difficult decision to change the railway, the government not only did not need the Bank as an excuse, but actually asked that the Bank *not* be involved because of the belief that an open Bank role would be a political liability.

The Bank Cannot Serve in the Place Either of the Government (vis-a-vis the railway) or of Railway Management (vis-a-vis the government). A frequent lesson from analyzing performance agreements is that they contain inappropriate or irrelevant goals. For example, a commitment by railway to government to maintain a locomotive availability ratio of (say) 75 percent, is an open invitation to government officials to interfere in an area in which they have no authority or expertise, and for which few appropriate sanctions for non-performance are available. Physical traffic commitments can be even worse because they can contain conflicting incentives (cutting rates or favoring heavy loads can easily generate traffic at the expense of financial performance). Bank lending often contains conditions which effectively put the Bank in the same position as either government or railway in a performance agreement. Lending for institutional reform (as compared to lending for technical improvement) will require that particular care be given to developing conditions which accurately express the country's (and Bank's) underlying objectives, but which do not put the Bank in the position of involvement in day-to-day technical or operating decisions.

Limits on the Management Model. Developed country managers are schooled in the belief that problems of institutional behavior can be solved by adjusting the organizational structure so that authority, responsibility, incentives and resources are as thoroughly decentralized as feasible within the need to enforce common policies and objectives. While this may well be true almost by definition, it is not the actual prevailing managerial ethic in many developing (or some developed) countries. For example, a well known barrier to improved decision making in Africa is the lack of delegation of power: all decisions are made at the top, and thinking from below is often neither encouraged nor rewarded. The CEE and CIS railways are rooted in societies which have been generally lacking in familiarity with the techniques for, and implications of, profitability analysis and profit center management as well as decentralized decision making. Emphasis in Asia on respect for authority and promotion by strict seniority, and in Africa on formal education or tribal affiliation, has significant implications for managerial continuity and individual accountability. Reform plans must start with an approach that will

work under prevailing values while providing training and incentives to support change over time where that is appropriate.

The Dilemma of the “Window of Opportunity.” Railway “problems” are costly, deep and enduring. Railways have repeatedly demonstrated an ability to shrug off attempts at change, especially when the political mandate of the government is seen to be shallow, unstable or transitory. A cogent argument can be made that the kind of patient, long-term process of change employed by developed countries is infeasible or too costly for developing countries: if the opportunity for change presents itself, it should be seized, even if only partial results can be obtained. It can also be argued that developing countries should be able to learn from the developed country experience and thus restructure more quickly. These factors influenced the Bank’s decision to support the rapid changes now taking place in Argentina.

The dilemma is in making the tradeoff between the desire to move quickly and the need to make good decisions. Political opportunities *can* be missed if decision making takes too long, and the cost of obvious inefficiencies mounts until change is implemented. There is no question that the personal priorities of political leaders and managers often create the opportunity for change which would not arise under other possible appointees. But breakneck, imposed changes often lack political legitimacy and can easily engender a resulting backlash—and substantive mistakes resulting from inadequate analysis and planning are always expensive. Railway change in the developed countries actually *took* years of planning and implementation, including false starts and delay, even though ample resources were available to plan and manage the process and despite the demands of political decision makers for immediate action.^{19/} This does not mean that the process must always take as long or be as costly in the Bank’s borrowing countries: it does mean that decisions as to the scope and timing of change, and a lending program to support change, will very much depend on the circumstances of each case, that they should be made *explicitly*, and that the political and economic benefits and risks of rapid versus measured interventions should be fully understood and accepted.

^{19/} For example, the U.S. Railway Association, the agency created to plan and oversee the restructuring of Conrail, expended over US\$150 million during its 12 years of work for planning and administration of the restructuring program of Conrail.

5

A LARGER ROLE FOR THE PRIVATE SECTOR IN RAILWAY CHANGE

Explicitly promoting the role of the private sector in enterprise reform is a relatively new, but growing element in Bank lending.^{20/} Several of the railway projects discussed above in detail contain a privatization component. The reform of FA, for example, is grounded in transferring to the private sector operation those rail activities which can be expected to become commercial, and in asking private sector operators to be prepared to provide for the state's account activities, primarily suburban passenger services, which the state itself will no longer be in a position to provide directly.

The Bank's general policy of encouraging the expansion of the private sector's role in state enterprise activities is particularly applicable to railways because many different types of private sector involvement are possible. Experience with state-owned railways which have begun to emphasize various private sector links has been substantially positive,^{21/} and not just because of the net revenue contribution to the enterprise budget. A possibly more important effect has been the recognition by railway staff that they are not necessarily totally divorced from the private sector; they can compete, and they can make a profit, at least on some activities. This realization has been a good morale builder, and it helps change the way the enterprise views itself. The effort is not without some risk, of course, and the ventures will not be uniformly successful. There is also a risk of corruption (because politicians want to be involved in the way state assets are sold or leased) which can be minimized, but not eliminated.

Perhaps the most important point about the term "privatization" is that it should be understood as a *spectrum* of possibilities, and not a single, either/or decision. The aim, in most cases, is not so much a sale of assets to the private sector as it is to promote contestability in markets the railway serves, or purchases from. A better phrase might instead be *involvement of the private sector, or private sector development (PSD)*, which is the term now preferred in the Bank. Railways are a rich source of examples (actual or potential) of the various possibilities for PSD. There is no exact set of terms to describe the range of opportunities, but a number of general types of involvement can be listed.

"Traditional" or Small-Scale Relationships

Many railways, especially in the U.S. and Canada, have long engaged in what are called "pipe and wire" leases. This is a situation where another entity, usually a public utility, would like to place a pipe or wire along or under the railway right-of-way. The railway will typically allow the activity, but will charge an annual fee. This can range from very small, single pipe transactions to quite large ones where a utility wants to run a high voltage electric transmission line for a considerable distance along the railway right-of-way. Other traditional activities can include leasing of station space to a restaurant or newsstand operator, or providing low cost leases on railway-owned industrial land in order to promote the growth of business which will ship by rail. There is little risk for the railway in this type of activity,

20/ For a detailed discussion of the issues in promoting the role of the private sector in railways, see Proceedings of the 1991 World Railways Congress (1991). See also Galenson and Thompson (1993).

21/ JNR, BR, and Amtrak furnish good examples of this type of activity.

and the only cost is the retention of a small staff to manage the railway's interest (mostly billing, collecting, and periodic revaluation of charges) in a large number of small leases.

“Non-traditional” Activities or Joint Ventures

These activities include larger scale station and station area economic development projects, such as Washington Union Station, or many similar projects in Japan and Europe. In general, these are joint ventures between railway and private sector in which the railway contributes its ownership of valuable urban real estate and the private developer contributes the development capital and development planning and management expertise. These projects have usually been tied to a railway station where the passenger flow was one of the sources of revenue generation, but some projects have involved surplus rail property which no longer has any rail use. These projects can be profitable, but they can obviously also have financial and political risks for the railway. They also absolutely require that expertise be brought into the railway from the outside.

Another example of a joint venture with particular relevance to the Bank is the use of railway right-of-way for fiber optic cables. Several of these projects have already been completed in the U.S., Europe and Japan as joint ventures between the railway and a telecommunications company. Railways are fortunate in having rights-of-way which furnish continuous links between urban centers without the need for expensive and environmentally sensitive acquisitions by the telecommunications company. There is a natural deal: the railway contributes the use of its right-of-way, the telecommunications entity installs the cable and operates it. The railway gets much better communications services, a fee for the installation of the cable, and a share of the revenues (or profits) of the communications traffic: the communications company gets a cheap and readily available right-of-way and an enormous increment in capacity. Both benefit. Here again, managerial and investment expertise is required which is not typically part of a railway staff.

Using Railway Assets for Non-Rail Businesses

There are a number of examples of this type of activity which, in effect, constitutes a private sector non-rail venture by the railway. Nigeria Railways Corp (NRC) has used its railway printing plant to do contract printing jobs for a wide range of non-rail customers (activity which was probably not profitable). Zambia Railways produced and sold office furniture from its locomotive workshop in Kabwe, Zambia. Tanzania Railways Corp (TRC) used its railway catering facilities in Dar-es-Salaam to sell food to local restaurants and to the public. A major telecommunications company (U.S. Sprint) was founded as a way to sell to the public the excess capacity which the Southern Pacific Railroad had in its corporate microwave system. Several railways, including Amtrak, have used railway shops to assemble or repair non-railway equipment such as heavy diesel engines.

In the abstract, this is an appealing idea as it appears to be a “free” use of surplus capacity. In practice it is generally not true. State-owned railways are not usually commercially sophisticated enough to get their prices right, and, more important, they often get their costs wrong. They also may attempt to compete in activities where their assets (and expertise) are not truly competitive. There are positive opportunities, but they are not without considerable risk. In many cases, it is probably better for the railway to divest truly surplus capacity rather than attempt to use it to compete in fields unrelated to railway operations.

Contracting with the Private Sector for Services

This field has already received a great deal of attention, but has some unusual aspects in the railway area. There are, of course, the well-known functions such as janitorial services and food catering. Many railways have contracted out these activities, even in the developing countries. The primary issue is employee (labor union) resistance. Another manifestation is contracting with hospitals or physicians groups to provide medical services in place of the railway medical department: this is also reasonably well-known. Less prevalent in railways is contract maintenance of the right-of-way, both because of labor union resistance and because there are legitimate issues of safety and coordination of operations and maintenance activity between railway and contractor which do not arise with the same severity in most other modes. The right-of-way for the Shinkansen (the JNR Bullet Train line) is entirely maintained under contract with the private sector, and is done much more efficiently than maintenance on the JNR conventional lines. Another possibility is contracting with the private sector for maintenance of wagons and locomotives. Interestingly, this arose in the U.S. where there is no particular problem with in-house locomotive maintenance (U.S. locomotive availabilities are among the highest in the world). The impetus in the U.S. was economic, as was the decision no longer to make locomotives in-house when outside sources became available. Locomotives have become extremely expensive and specialized pieces of equipment which must be effectively utilized, and it is simply more effective and less costly to hire someone to do the job than to try to do it in-house.

An extreme example is a management contract for the entire enterprise. In 1980, the Government of Nigeria signed a contract with RITES (the consulting arm of Indian Railways) under which RITES agreed to take over the management of NRC completely.^{22/} There are several companies in the U.S. which manage short line railways for their owners (usually industrial companies or local governments) for a fee, and Amtrak provides commuter services in Boston, Massachusetts under a contract with the Massachusetts Bay Transportation Authority (Amtrak operates only intercity trains, and is forbidden by law to provide commuter rail services unless it is under a contract which provides for full cost reimbursement plus profit). The government of Argentina has recently awarded concessions to manage and operate the Buenos Aires subway and the suburban services of FA—as well as all of the freight services of FA. A similar approach is now being studied in Chile, Peru and Mexico.

As the NRC experience illustrates, the success of contracting is primarily determined by the ability of the parties to define clearly their objectives, and not by any inherent technical difficulty. Almost every activity has already been successfully contracted by a railway: the challenge is in recognizing the opportunity, in overcoming internal resistance (usually labor, but also often defense of managerial turf), in finding and maintaining competition, and in developing good contracts which have the right incentives.

22/

Although RITES succeeded in significantly and immediately improving the technical performance of NRC, the contract was not a success. The reasons are not completely clear, but appear mostly related to the lack of clarity and conflicting provisions in the contract. Had each party known better how to formulate the objectives and responsibilities in the contract, it might have met with much more success.

The Private Sector as a Source of Funding

Market based economies make considerable use of the private sector as a source of funding which the enterprise would otherwise be required to generate itself or obtain from the government. This is done either through direct borrowing, or through leasing. For example, almost all U.S. railway wagons or locomotives are actually mortgaged to non-railway lenders; virtually no railway wagons (or commercial aircraft) are bought for cash by railways or airlines. Leasing is a parallel method of funding whereby a private company, often specialized in leasing, buys a piece of equipment and then leases it to the railway for a fee (direct or implicit). Many railway wagons and locomotive are leased; in fact, a recent leasing program has arisen for locomotives in which the lessor also provides maintenance and the railway pays by usage unit (per megawatt-hour of tractive effort, or per locomotive-km). Indian Railways has recently inaugurated a subsidiary, Indian Railways Finance Corporation (IRFC), which will issue bonds to private individuals and entities, buy equipment, and lease it to IR.

The opportunity for leasing is especially favorable for specialized, or limited use equipment. U.S. railways do not own any tank wagons—they are all owned by private lessors or users. In most cases, unit train wagons used for the transport of coal to electric utilities are owned by the utilities because the utility's cost of capital is less than for the railway, because the utility wants total control over the use of the wagon, and because the railway has no other use for the equipment. In some cases, the railway maintains the wagons (for a fee); in others, the utility maintains them. The detailed arrangement is reflected in the total rate for the coal hauled.

An interesting variant on leasing is the reverse transaction, i.e., leasing of state-owned assets *to* the private sector in order to promote the process of growth of the private sector. This has already emerged in Hungary, Poland, and the CIS countries where there may be a need to lease state-owned trucks to potential entrepreneurs who would otherwise lack the capital to get started in the trucking business. Exactly the same issue would arise if a railway wanted to promote private sector contract locomotive maintenance; the cost of a locomotive shop is so large, and the risk so high, that leasing the shop to an entrepreneurial venture (possibly with railway equity participation) could be the only feasible way of getting the process started. Versions of this approach are now being considered in Mexico.

Operating Concessions and Franchises and Outright Sale of Public Assets or Activities to the Private Sector

Operating concessions by a private sector, non-rail entity are often viewed as a relatively new innovation, but they are not. Wagon-Lits Cooks began in Europe as a concession operator of sleeping and dining coaches on railways which eventually became state-owned. The Pullman company provided sleeping car services for railways in the U.S. on much the same basis. Several railways (India and Pakistan, for example) have operated smaller stations on a concession basis under which an individual receives a concession to manage the station, sell tickets, and provide customer services, in return for which the concessionaire receives a share of revenues from tickets and sales of food or other items in the station.

Interesting examples of the use of franchising on a larger scale are emerging in developing countries. In Thailand, the railway (State Railways of Thailand, SRT), franchised the marketing and operation of several passenger trains to a private operator. On a much grander scale, Argentina is concessioning operating authority on major segments of the state-owned freight network to private

operators. Five of the six freight concessions are now in operation, as are three of the suburban passenger concessions. The right-of-way will remain in state ownership, and the government (through FA) will receive a 15 to 20 percent share in the equity of the new franchise.

Another version of "concessioning" is found in Amtrak, VIA and the Japan Freight Railway Company. These are, in fact, concessions to operate a particular type of service over the tracks of another entity in return for the payment of a fee to the franchisor. The cases of SEFICS (Senegal) and COMILOG (Gabon and Congo) also illustrate operation for a fee of a specialized rail carrier over the right of way of another railway. An alternative version of the same approach is the case of SJ in Sweden, where the operating function has been separated from track ownership and maintenance and, in principle, public and private operators could provide service over the same track. The EC order to require European railways to separate their railway operating and right-of-way functions could well lead to the same position, especially for freight which is now suffering from the way in which many European railways emphasize passengers and down-play freight.

Planned future Bank lending will place additional emphasis on concessioning of railway services to the private sector. Where the railway has a largely commercial role, and with appropriate attention to the form of the concession, this approach appears promising.

The separation of railway between right-of-way and operations could create an opportunity for broader use of competitive operations on common track. This could range from a mere separation of track from operations (with both in public hands as in Sweden), to competitive public operators on public track (a logical development of the SJ or EC proposals), to private operations on publicly-owned track (Argentina), to multiple operations on privately-owned, common track (as occurs in joint terminal companies in the U.S.). The potential advantages, especially the opportunity for creating competition and the ability to privatize some services (freight) while keeping other services (commuter) in the public sector, are promising; the problems, in particular the issue of conflicting track access and coordination of track maintenance with operations, are also well-known. There are many instances in Bank lending where the idea deserves further exploration.^{23/}

Even outright privatization of a railway is subject to degrees. Conrail in the U.S. and the New Zealand railway are examples of total transfer from public to private sector. In another case, the U.S. Federal government sold the Alaska Railroad to the state of Alaska because both governments felt this would better serve the interests of the state.

A more relevant example might be found in the rapid growth in the U.S. of what are called "short line" railroads. These are railroads which are formed when a larger railroad decides that a branch line, or system of branch lines, is no longer profitable for the larger railroad because of rigid labor work rules, difficulties of operation of a light density railway, or other localized factors. Several larger U.S. railways have developed aggressive programs of finding entrepreneurs who will acquire the line and operate it on a low volume, low cost basis. In some cases, the larger railway will help in financing the transfer, or a local government will acquire the line and lease it to an operator. Many of these lines fail because of over-optimism on the part of the investor. Others succeed quite well when: the short line operator reduces labor costs (e.g., by personally driving the train and by generally abolishing all labor

^{23/} See Moyer and Thompson (1992).

craft distinctions); does a better job of marketing at the local level than the larger railway could ever hope to do; and, has major shippers which are also investors and furnish a stable base of traffic.

Issues of Private Sector Development

Although they have been well discussed in many other sources, it will be useful to summarize several issues as they bear on increasing the role of the private sector in railways.

- **Skills.** Very few state-owned railways possess the skills needed to identify, analyze and manage business ventures, especially outside the field of railway activity. It is absolutely vital that skills from outside the railway be acquired and brought to bear to analyze business opportunities and to protect the railway's interests vis-a-vis its private sector partners.
- **"Commercialization" Before Privatization.** Many governments are impatient to "privatize" and insist on selling assets or ventures "as is." In the railway area (as elsewhere) this is almost always difficult or, often, a mistake. Most railway operations are currently inefficient and poorly marketed, and are thus essentially worthless in their present state. Depending on the circumstances, more value may be realized when the obvious inefficiencies are eliminated and the activity operated on an effectively commercial basis for a period before involving the private sector, either as purchaser or partner.
- **Process Integrity.** Sale or other transfer of public assets to the control of the private sector has always been a contentious process. At one level, this touches the obvious and very real concern for corruption, which arises in every country. At a second level, this involves whether a "fair" price is received—a point on which endless debate is possible. The same problem can arise when a public entity makes non-competitive contracts for services with a private sector entity. The issues must be as fully resolved as possible, which means that the railway must proceed in a fully transparent and professional way.
- **Regulation.** In many cases, privatization can mean the transformation of a public monopoly into a private monopoly. In these cases, the issue of the need for regulation (if any) must be addressed. The regulation needed can cover economic issues as well as safety or "fitness" questions. On another level, the railway may have labored for years under a regulatory system which was intended to impose cross subsidies on the railway; this must change if the enterprise is to be operated in private hands.
- **Level Playing Field.** The way in which a railway privatizes its activities, or engages in competition with the private sector can give rise to a number of important competitive issues. For example, use of the railway workshop to do maintenance for outside customers can easily represent unfair competition with a nascent private sector outside the railway because the outside competitor did not get its facility free and does not have access to public capital. Rules are needed to ensure that the railway activity allocates its costs properly, and fairly includes a capital charge to its non-rail ventures. The same issue arises if a railway facility is sold or leased to the private sector: a "sweetheart" deal on either price or lease or financing terms with a purchaser, especially if the

purchaser is a joint venture partner, can give the new venture an unfair competitive advantage over others in the sector.

- **Payment for Social Services.** Under competition, private sector companies cannot absorb the deficits of socially imposed activities. While it is entirely possible, even desirable, to contract with the private sector to provide services for the public sector for a fee, payments must be clear and adequate. Activities cannot successfully be privatized with the hope that the new operator will be willing or able to continue to operate losing services, or operate in an inefficient way, just like its public railway predecessor.

A RAILWAY ROLE IN SAVING ENERGY AND ENHANCING THE ENVIRONMENT

An added element of infrastructure lending has emerged during the course of the Bank's experience with railway lending.^{24/} There is a growing concern for the impacts of Bank projects on a country's ability to improve its energy efficiency in transport, and a determination that Bank projects should improve, or certainly not harm, the environment. Because steel wheels on steel rails generate very little rolling friction, rail has the technical capacity (under the right circumstances) for moving people and cargo while using less energy than other modes. Rail also can produce more transport output per unit of land area needed, and generate less noise and pollution per non-user impacted, than other modes. As a result, rail is receiving increasing attention as a potential solution to energy and environmental problems.

Unfortunately, the environmental and energy role of railways is an issue prone to simplification. Generalizations are dangerous; a useful assessment of the potential rail contribution needs to take into account the particular circumstances of the country involved and of its transport needs and network. Further, as with the potential economic role of railways, rail's potential energy and environmental advantage must be converted from theory to practice: a poorly managed and inefficiently operated railway can all too readily turn environmental and energy pluses into minuses.

Rail's Contribution to Energy Conservation

Energy use has become a major issue in modern economies. The world's largest export and import flows are associated with energy products. Consumption of energy in all forms leads more or less directly to various types of by-product air, water and noise emissions, a matter of increasing concern in developed as well as developing countries. Access to energy supplies, for example cheap fuel for personal vehicles, has become so intertwined with quality of life and personal choice issues that potential changes in energy cost or energy policy are among the more complex that any nation faces, and obvious distortions in energy prices cannot easily be addressed by political decision-makers. There are few easy energy decisions left.

In all economies, transport is one of the larger consumers of total energy. In addition, transport energy use tends to be closely related to petroleum sources which have often been associated with political and trade instability and price uncertainty. Transport energy consumption has characteristic patterns of use emissions, both in chemical and spatial terms (sometimes international, in the case of greenhouse gasses or airborne pollutants, as well as domestic or local), which often make transport a disproportionate source of undesirable environmental impacts, especially in congested urban areas. The interactions among transport, energy and environmental impacts focus attention on ways in which transport energy consumption can be managed.

The theoretical potential of rail transport for promoting energy efficiency in transport has been well recognized in the literature. For example, a recent report of the Commission of the European

^{24/} This discussion quotes heavily, without further attribution, from Gwilliam, Shalizi and Thompson (1994).

Communities (1992) stated that, with full passenger occupancy, a gasoline car requires 2.5 times more energy per passenger kilometer than an inter-city train. In the freight market a simulation study of a number of corridors by the U.S. Federal Railroad Administration concluded that rail could be more energy efficient than truck transport in all the specific situations examined.^{25/} Environmental observers have frequently made arguments along these lines,^{26/} and a large number of other studies have generally reached the conclusion that rail is inherently more energy efficient than other modes of transport.

There are many readily quantifiable variables which influence the relationship between transport use and energy consumption, including various physical or technical parameters (type of mode, load, distance, speeds, size and design of vehicle and its engine or motor, and source of power, among many others). There are other factors, including operational patterns, maintenance practices, age of vehicles, impacts of planning distortions, etc., which are more difficult to specify or generalize, but which introduce a lot of unpredictability into assessments of energy use. In actual practice, there are very few safe generalizations to be made about which mode is energy "efficient", and the usage of single point values or even narrow ranges for transport energy consumption (e.g., "rail uses X kilo Joules per tonne-km while trucks use Y times as much") are often highly misleading.

In measuring the actual situation, the potential advantage of rail in energy consumption per tonne-km can often be diminished by some inherent characteristics of rail operations, namely: indirectness (constraints of topography make actual point-to-point travel distances average up to 20 percent more by rail than road); inflexibility (the larger loads needed to fill a wagon or coach makes it more difficult in practice to achieve the high load factors on which most energy consumption comparisons are based); and railways often fail to achieve the theoretical operational efficiency on which energy comparisons are based because the typically larger company size and public sector monopoly position of railways make them less responsive to economic pressures, including energy efficiency.

Rather than relying on point estimates, *ranges* should be used for general transport energy consumption comparisons among modes. Where accurate values are needed to support significant policy or investment decisions (e.g., should a country invest in rail in order to get freight out of trucks and people out of autos in order to "save" energy?), superficial estimates cannot replace an accurate and often laborious description of all of the forces and parameters at work. Even then the results should be taken with a considerable grain of salt. Box 6.1 is based on a thorough search of the transport energy literature and gives a picture of the range of perfectly valid measurements or estimates of energy intensity of transport, depending on the values taken by the independent variables mentioned above. As this Box shows, rail probably does enjoy a potential advantage in energy usage, but the advantage can easily be negated in particular circumstances.

25/ U.S. Department of Transportation (1991).

26/ See, for example, Lowe (1994).

Box 6.1: Energy consumption ranges in transport

Energy Consumption Ranges in Passenger Transport (kilo-Joules/Person-km)			
<i>Mode</i>	<i>Low End of Range</i>	<i>Mid-Range</i>	<i>High End of Range</i>
Human:			
Cycle		100	
Walk		225	
Swim		1,200	
Rail	150	350	2,000
Bus	200	400	2,000
Motorcycle	800	1,000	1,800
Auto	600	1,500	5,000
Air	900	1,200	7,500
Energy Consumption Ranges in Freight Transport (kilo-Joules/tonne-km)			
<i>Mode</i>	<i>Low End of Range</i>	<i>Mid-Range</i>	<i>High End of Range</i>
Air	2,000	3,000	12,000
Pipeline	200	250	2,000
Rail	100	200	2,000
Truck:			
Small		6,000	8,000
Medium		4,000	6,000
Large		1,000	2,000
Water	100	200	1,100

Source: Thompson, 1994.

Rail's Environmental Contribution

The environmental impacts of transport can be global or localized (or both). The global warming effects of carbon dioxide (CO₂) are directly proportional to carbon-based fuel consumption and ultimately independent of the location of consumption. A shift of traffic from air or road to rail would be thus most environmentally beneficial where it involves a move away from hydrocarbon fuel as the primary energy source and where the railway is electrically powered, efficiently operated and underutilized. However, carbon-based fuel use could also be reduced directly if the power plants of aircraft, autos and trucks could be converted to alternative fuels (e.g., electrically- or hydrogen-

powered vehicles). Hence, even where the global effect of a CO₂ reduction resulting from a shift of traffic to rail is established, its timing and *benefit/cost ratio* relative to other options also need to be justified.

In contrast, noise and other air pollutants, such as CO, NO_x, Pb, SO₂, etc., have primarily localized effects, are less directly proportional to hydrocarbon fuel consumption per se, and can be suppressed in various ways without changing the primary energy source. For local air pollutants electrically-driven railways have the advantage that pollution (if any) at the power source (which can be built well away from population centers) is easier to control than at multiple, mobile sources (within population centers).

This said, even though the environmental friendliness of the rail mode can be enhanced by the greater use of electric traction for rail transport, the benefits of rail electrification can be misunderstood. The economic attractiveness of electric traction to railways arises in large part from the reduction in locomotive maintenance costs and the greater acceleration potential that it offers, and to a lesser extent from energy cost savings. In fact, taking generation and transmission losses into account, rail electric propulsion does not usually have any large advantage in terms of overall efficiency of conversion of basic energy into effective work. Electrically-driven railways, therefore, offer a significant environmental benefit only where electricity can be generated (i) in a less polluting way (e.g., from renewables such as solar or hydro sources), or (ii) where pollution impacts can be more easily controlled through comprehensive abatement measures at the power source. This cannot always be presumed to be the case. For example, the electricity for China's electrified railways is generated largely from coal, in plants not yet subject to comprehensive abatement measures.

Energy and Environmental Benefits in Perspective

Energy, per se, is only one of the costs, and often only a minor one, which influence the usage of transport which is, itself, only a derived demand. The total costs of transport include vehicle ownership and maintenance, infrastructure construction and maintenance, operating labor, management, and many others, including environmental externalities. At the same time, the prices (tariffs, and/or fares as well as user charges) paid by transport users may well be more (or, unfortunately, sometimes far less) than actual economic costs because of bad information, pricing strategies, monopoly behavior, non-inclusion of externalities such as congestion and pollution, and government taxes and subsidies, among many other issues.

Equally or more important, the competitive position, and the resulting modes and amounts of transport demanded, depend on factors well beyond the narrow issue of the cost of transport. The user also evaluates a wide range of quality-related factors such as travel time, waiting time for departure or shipment, reliability of expected travel time, comfort and safety (or loss and damage) of the transport, minimum shipment size or conditions of travel (such as fares by time of day, day of week, etc). Many of these quality factors far outweigh the mere effect of the total cost of transport, even more the cost of energy, within the overall equation. As a result, it can be extraordinarily difficult to measure or influence the relationship between the ultimate amounts and patterns of transport demanded in a market economy and the usage of energy by the transport sector derived from that demand; perfectly explicable market forces can make the most energy "inefficient"

transport mode into by far the most economical choice, both for passengers and for freight. Attempts to influence energy usage by changes in energy costs, or even in broader energy policies, may not have anything like the intended effect if the market is fully empowered to act.

Nor should the present competitive balances and modal patterns be thought of as immutable. Changes in technology constantly influence the characteristics, including energy consumption, of all of the modes of transport, affecting competition accordingly. More important, the structure of economies changes in characteristic ways as economies develop in income per capita, or transition from planned to market organization, with a consequent evolution in the types of economic activity conducted and in the amounts and types of transport demanded.^{27/} The dramatic transport developments in the formerly planned Central and Eastern European (CEE) and Commonwealth of Independent States (CIS) economies, where rail freight traffic has fallen by half or more during the transition from planning to market, are a good illustration of this phenomenon.

Finally, in a number of significant cases, transport (rail or otherwise) itself is only one available means to an end. A particularly important example of this point is the tradeoff between transport and communications and information management. Some tradeoffs, such as substitution of telephone calls, for business or personal trips are well known. The impact of more recent technologies, such as Faxes, E-Mail, and "virtual reality" on the usage of transport, and thus on the resulting usage of energy will soon be felt. It is, for example, far more energy efficient to work at home and interact professionally via E-Mail than it is to commute physically, and far less energy is used to send a fax than a letter or other physical document.^{28/} At the same time, some of the more energy intensive usages of transport, especially Just In Time (JIT) logistics systems, are possible only because of modern communications which permit the close integration of each of the steps of the chain, but which actually consume more energy than their predecessors. There is little doubt that these emerging communications tradeoffs could be a significant tool in the effort to manage energy efficiency within the overall economy—and to promote overall economic efficiency even if this requires an increase in energy consumption.

^{27/} See, e.g., Bennathan, Fraser and Thompson (1992), and Blackshaw and Thompson (1993).

^{28/} Estimates indicate that telecommuting via modem and Faxing can *reduce* energy consumption, compared with the alternative physical transport of paper documents or people, by 95 to 99 percent -- and a PC with a Fax modem is much cheaper to buy and operate than a commuting vehicle, both for the individual and for the community. While it is unrealistic to predict a complete substitution of telecommuting for physical commuting, it is already common in some companies and the US Government to let employees stay home a day or two per week and telecommute (and each day is a 20 percent reduction in commuting energy consumption). Alternating Friday compressed work weeks (assuming the employees stay home on their day off) have the effect of a 10 percent reduction in commuting trips.

Rail Policy Implications

The policy implications of rail's potential energy and environmental advantages are not easily reducible to simple prescriptions because the actual achievement of energy saving and environmental benefits by rail transport depends on the effectiveness of rail use, and use effectiveness depends on the existence of a market-proven superiority of the rail mode in meeting customer demands and on effective operation of the rail facilities. Unfortunately, the Bank's experience has shown that the mere existence of a rail track does not guarantee either a market which can use rail's advantages, or effective operation of the railway even where it has an appropriate market role.

The question is under what circumstances the Bank should encourage governments to intervene to increase the level of rail use purely on energy and/or environmental grounds, given that this would impose costs on users which they would not otherwise choose to bear. Government intervention may indeed be justified where the money costs to the operator do not properly represent the true economic costs. This may be so in three categories of circumstance:

- Where road user charges fail to cover the real costs of road infrastructure. To the extent there is a subsidy which has a significant competitive impact (and this can be difficult to define in practice), getting the charges for road use right is preferable to the introduction of compensating distortions of private choice by subsidizing rail.
- Where urban road congestion exists, but pricing solutions are considered practically and politically too difficult to implement. In such cases, *urban* rail projects, particularly in the context of comprehensive urban transport management plans, may help reduce the rate of growth of road congestion, and they may contribute to building and maintaining a more sustainable urban environment.
- Where environmental impacts of transport can be significantly reduced. There can be a case for favoring rail transport infrastructure investment, irrespective of whether rail is a more energy efficient mode or not, if electric rail traction is a means of redistributing or suppressing environmental effects (such as air and noise pollution).

Operationally, however, it is hard to quantify benefits or determine the "right" price for externalities. Even in European countries, car ownership and distance travelled are increasing more rapidly than travel by rail despite the fact that good alternatives to automobile travel exist—in the form of a well-developed rail network and a railway that pays particular attention to passenger traffic—and the cost of travelling by automobile is relatively high as a result of high taxes on gasoline. In addition, the share of freight transported by road is growing, because trucks and airlines do a better job of integrated, inter-European traffic management than railways. Given that transport users respond to the sum total of the economic forces they perceive, and that their behavior can only be established by investigation on a case by case basis, there is probably no good case for a global preference for rail investments independent of these careful calculations. There may well be a case, but it must begin as a rebuttable presumption.

The Bank experience must be seen in this light. The Bank has already demonstrated its willingness to invest in rail projects. It has also discovered that investing in poorly managed railways which do not attract traffic is not only uneconomic but environmentally useless or even harmful. The emphasis should thus continue to be on the institutional reforms necessary to realize the potential of rail transport, including its benefit for the environment.

CONCLUSIONS AND POLICY IMPLICATIONS: A FRAMEWORK FOR BANK LENDING

Bank lending to railways has undergone a significant and positive evolutionary change, away from project-based, hardware lending, and toward encouragement of institutional change, including restructuring. The shift is one of emphasis which is not fully reflected in all aspects in all loans. There is also clear evidence that not all answers have been found: the search continues for methods and conditions that work.

“The Railways Problem” argued, and subsequent experience has confirmed, that changing the institution is the *sine qua non* for progress in many of the Bank’s borrowing railways. The discussion below focuses on determining the type and degree of institutional change to be promoted, and *how* to do so. In thinking about “how,” however, it is important to recognize that the type and depth of institutional change to be undertaken is not the same for all railways, and that the full process in any railway will usually take a patient effort over years—not a few conditions in a single loan.

The objective of the change in the lending approach discussed below is to make the railway respond to the needs of its customers (the market) through the working of clear, mostly financial incentives. Properly formulated “profit” centers, combined with autonomy to control rates and fares and based on ability to manage costs, are a powerful recipe for producing economically rational behavior. Whether or not the railway is publicly-owned (and only the U.S., Canada, New Zealand, and Japan currently have major *privately*-owned railways), this is the best, probably the only model for survival when the railway faces significant competition from privately-owned highway modes. It is also proving to be the best model for the effective provision of public service obligations.

Expressed another way, the remainder of this paper shows that enterprise survival in a competitive, market-based economy is an uncertain proposition, even for the competent, as U.S. railroad history amply demonstrates. Success cannot be assured, even with the best of goals, adequate resources, and fully acceptable assignment of authority and responsibility. Unfortunately, though success cannot be assured, *the rules of the game can be set so that poor performance in a competitive, market-driven environment is absolutely certain*. It might be useful to list these conditions of poor performance as a good starting point for the ensuing institutional analysis:

- Lack of a clear role or objectives—if the enterprise does not know what it is supposed to do, or if it has conflicting roles, or if it has a clear but irrational set of goals, the outcome is bound to be disappointing.
- Unclear authority—although some organizational overlap and tension can be creative, *someone* must ultimately be able to make and enforce decisions, and have commensurate authority and responsibility.

- Inadequate capital and financial resources—simple human ingenuity *can* work wonders but, alone, cannot fix a diesel turbocharger; that takes spare parts, and spare parts cost money, in hard currency. Politically-suppressed tariffs, if not balanced by adequate compensation, cause inadequate earnings and result in inadequate maintenance and investment.
- Poor use of human resources—railways are among the most complex of industrial institutions in size, geographical dispersion, technology, or operational discipline. The operational staff must be trained, stable and disciplined. Marketing staff must be aggressive and commercially creative. Management must be dedicated, highly skilled and willing to delegate and accept responsibility. None of these conditions are really possible with a poorly-trained, underpaid, politically-manipulated civil service, especially when the railway must compete for staff (and business) with a better paid and motivated private sector.

Regrettably, these conditions are not at all extreme or rare; instead, they are a reasonably accurate description of the prevailing circumstances in many of the Bank's borrowing railways. In fact, *they are often the real basis for the "railways problem."* *Unless these conditions are attacked and resolved, no lasting progress will be made.*

The difficulty of the problem being accepted, however, *experience has also shown that real progress is possible*, especially when the Bank's assistance is patient (and persistent) and based on an accurate diagnosis as to what is needed and what is possible. In fact, Bank involvement may be even more important in the cases where the railway must find a more efficient, focussed role than where traffic is expected to grow indefinitely. Undue pessimism about railway prospects or the likelihood of lending success for railways would deny the Bank the opportunity to achieve change at exactly the time when it is most needed and, in an increasing number of cases, increasingly possible.

As suggested, the type and degree of institutional change necessary may vary widely depending on the circumstances of the surrounding economy. No exact typology is possible, but there are a series of characteristics intrinsic to the railway and the economy which are important, and there are several relationships possible among railway, government, and market. The intrinsic characteristics include scale, technical effectiveness, traffic trends, and transport role. The most important variable in the railway/government/market relationship will be whether the economy is "planned," or market-based, or somewhere in between.

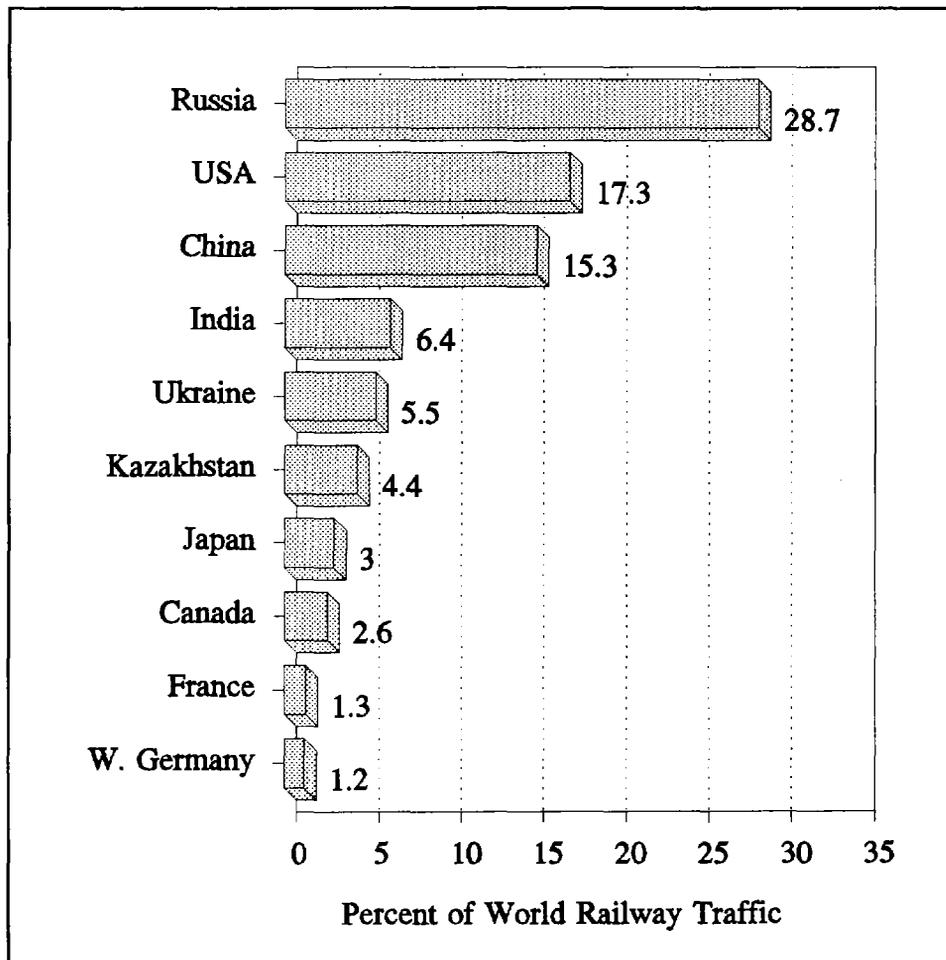
Annex B contains a detailed discussion and analysis of the data framing the issues of scale, technical effectiveness, traffic trends, and transport role. Each should have an effect on the strategy to be followed in railway lending.

Scale

The railways in many developing countries are among the world's larger industrial institutions (see Box 7.1). The Bank will need to allocate far greater resources to the analysis and development of strategic plans and lending programs for very large railways such as China, or in the CEE economies,

than for Ghana. Given the inherent inertia of an organization as large as that of Russia, China or India, *any* change must be expected to take a long time and will require commensurate resources.

Box 7.1: Scale of the top ten railways 1991, in percent of total world railway traffic (P-Km + T-Km)



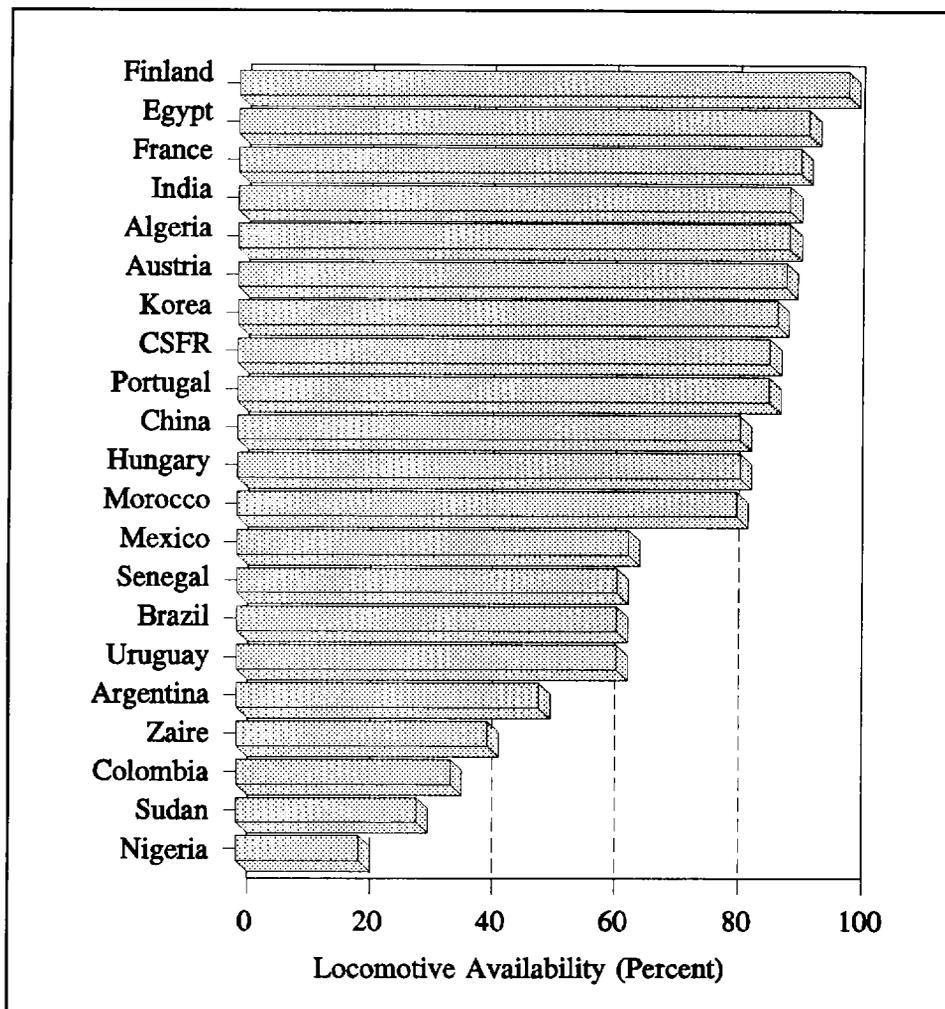
Source: World Bank Railway Database.

Management Effectiveness

There is a group of railways (Colombia, Nigeria, Sudan, and Zaire) where operations had effectively collapsed due to extremely poor maintenance of locomotives, with resulting locomotive availability ratios of 40 percent or less (see Box 7.2). Railways at this level were simply out of control, (Colombia and Sudan have subsequently improved their performance), whether because of loss of

technical capability, severe shortage of resources, disastrous government interference, or all three. Lending under these circumstances, in whatever form and amount, should be restricted unless and until there is a convincing diagnosis of the underlying problems and clear understanding and acceptance of the need for change.

Box 7.2: Management effectiveness: locomotive availability 1991



Source: World Bank Railway Database.

Railways having locomotive availabilities between 50 and 70 percent or so, especially if deteriorating (which, Table B.2 in Annex B shows, was not unusual), are giving strong indication of a serious managerial or resource problem. In particular, there is no acceptable explanation for poor locomotive availability due to a shortage of spare parts: either the railway is inept in not filling the need, or the government has not assigned a proper priority for the availability of foreign exchange to purchase,

or both. A plan for helping these types of railways will need to address the operating effectiveness issue, no matter how bright the picture might otherwise appear for traffic growth, because the railway is inoperable without adequate power.

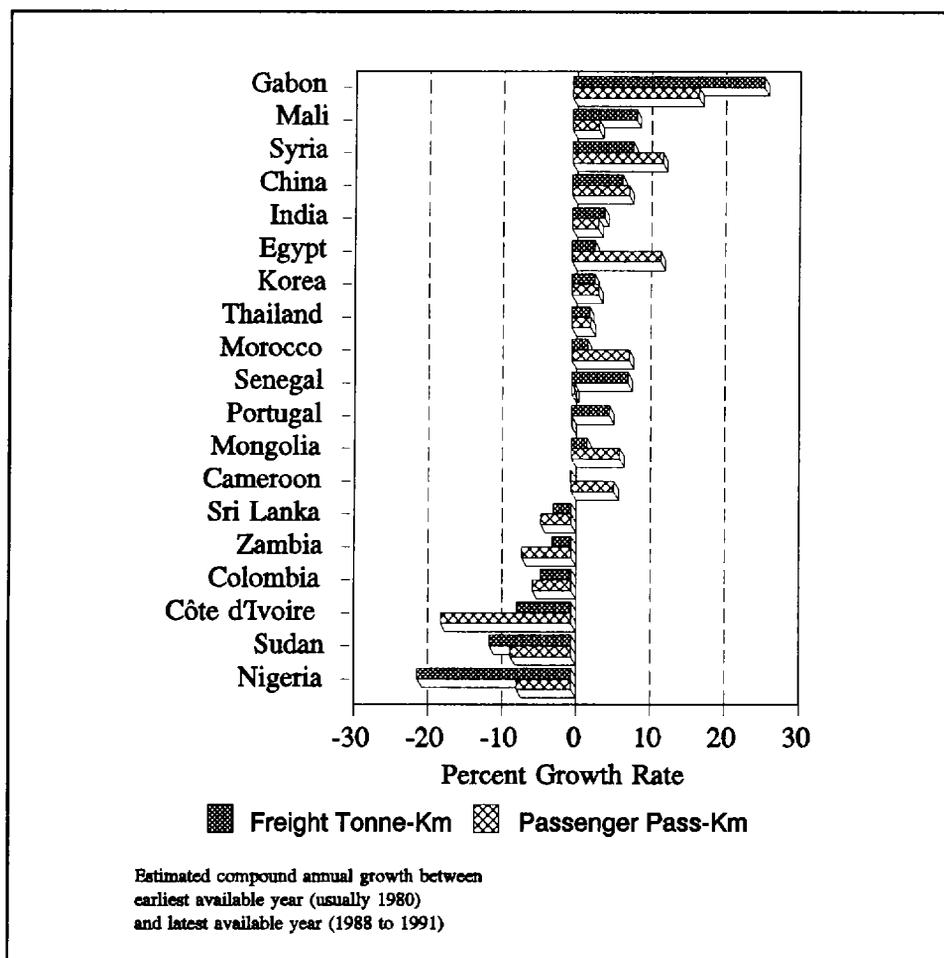
Other railways consistently show locomotive availability ratios of 80 percent or more, and generally show other signs of managerial control. China and India are, respectively, the third and fourth largest railway systems in the world and, making due allowance for differences in labor cost and access to capital and technology, measure up quite respectably in productivity comparisons. The same can be said of Brazil (RFFSA) and Korea. These railways have already shown a reasonable ability to perform effectively *within the rules of the game as they see them*. They have also demonstrated a reasonable command over the technology and management techniques required for railway operations. The focus in lending can legitimately shift to developing a better agreement with the government as to the future role of the railway including the influence of market pressures, to freeing the railway up to play that role, and to providing necessary technical and financial assistance.

Traffic Trends

Railways show dramatically different trends in traffic (see Box 7.3). Nine railways (Gabon, Mali, Syria, Egypt, Morocco, China, India, Korea, and Thailand) experienced vigorous growth in freight *and* passenger traffic (above 2 percent annually for each) between 1980 and 1991. Six railways (Colombia, Côte d'Ivoire, Nigeria, Sudan, Zambia, and Sri Lanka) saw their traffic *shrink* by more than 2 percent annually for both types of traffic. Mongolia and Cameroon saw high growth (above 5 percent annually) in passenger traffic with roughly stable freight traffic, while Senegal and Portugal experienced the opposite, namely high freight traffic growth with stable passenger traffic. Uganda sustained a 5 percent growth in freight with a 5 percent shrinkage in passenger traffic. The remaining railways shown in Annex B, Table B.1, experienced relatively stable, or slowly changing traffic.

A dynamically growing railway faces entirely different challenges than one which is stagnant or shrinking. Growth, assuming it is rooted in valid economic projections and a reasonable role for the railway, leads to a focus on capacity, investment and asset productivity; often the otherwise intractable labor redundancy or productivity issues can be solved by a growing railway because improvements need not come at the expense of jobs. By contrast, traffic shrinkage generates painful issues of plant and service reduction, and creates pressures for productivity improvement which, in the case of labor, come at exactly the time when they are the most difficult to resolve. Significantly, the need for "restructuring" in the sense of a continuing adjustment of the railway's services to the needs of the market, may be just as important (albeit less obvious) for growing railways as for shrinking ones. In both cases, the lending effort must be based on a realistic assessment of the railway's future traffic prospects.

Box 7.3: Traffic trends, compound growth rate (1980-1991) in rail traffic (percent)



Source: World Bank Railway Database.

The Role of the Railway

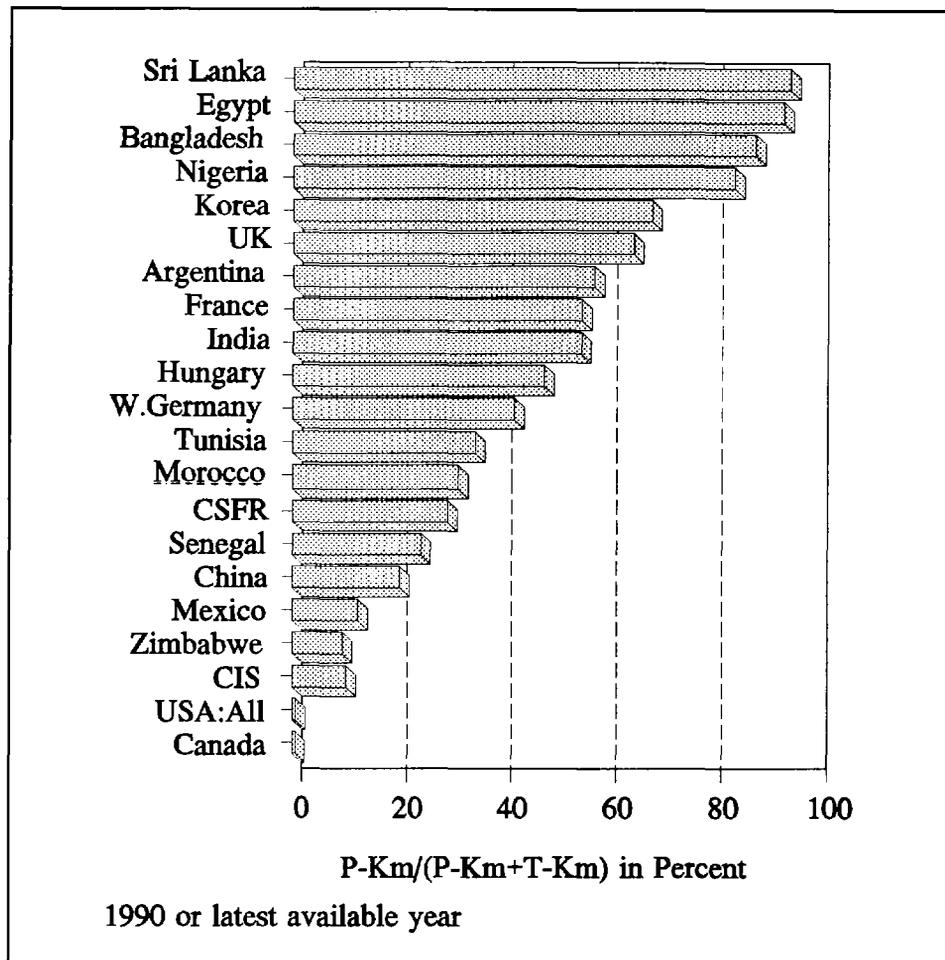
The railway's role has two different dimensions, the balance of railway traffic as between freight and passengers,^{29/} and the share of traffic carried by the railway as compared with other modes (see Box 7.4). Table B.2 in Annex B shows the wide range of railway activity in the passenger and freight

29/

If reliable data existed, it would be desirable to subdivide the passenger function into long distance versus urban/suburban services because these are very different markets, requiring different services and equipment.

markets. A few railways (Mexico and the North American railways, for example), as well as the CIS railways, are mostly freight carriers; others (Bangladesh and Sri Lanka) are overwhelmingly passenger

Box 7.4: The railway's role (passenger-Km as percent of total rail traffic)



Source: World Bank Railway Database.

carriers. The significance of this difference in mix is direct because railways heavily into passenger service can be expected to show lower productivity levels than railways concentrating on freight, a fact which the numbers support. For example, Amtrak and VIA, which carry only passengers, have a labor productivity (annual traffic units per employee) level which is about the same as the largely passenger-oriented European railways, whereas the U.S. and Canadian freight railways have labor productivity three to five times higher than any other country (the CIS, with over 90 percent freight traffic, approaches Canadian productivity levels). Another, more important point is also evident: with costs higher and

revenues lower (per unit of output)^{30/} because of politically imposed limitations on passenger fares (many developing railways severely undercharge for passenger as compared with freight services—see Box 7.5), passenger railways are also almost certainly going to be PSO driven rather than “commercial” railways. This has an important impact on the expected form and degree of relationship between railway and government, and on the degree of real autonomy which can be achieved. Passenger railways supported largely by the government (Bangladesh, Egypt, or Sri Lanka) will find it more difficult to develop the same degree of independence as railways with primarily freight traffic (Mexico, Zimbabwe, or China). Thus, the degree of government involvement will usually need to be greater for a predominantly passenger railway, and the performance agreement will need to be shaped accordingly. At an even broader level, passenger service poses a difficult question for the country and the Bank: “Which is the more important generator of development progress and thus the priority claimant on scarce resources, passenger service or freight service?” The question may be unanswerable in the abstract, but it may be critically important when (as often happens) the poorer countries want to invest large sums in passenger railways on environmental or social (or perhaps, political) grounds, but are unwilling to charge passengers directly for the use of the resources.

Table B.3 in Annex B shows another dimension of the railway’s role; the relative balance of freight traffic between rail and road (see Box 7.6). Certain countries (including, significantly, all of the CEE economies and China and India) are highly dependent on rail while in others (Argentina, for example) rail plays a relatively insignificant role. In all cases, the rail share is at best stable and in most cases it is falling, with the decline being most rapid where the current share is the highest.

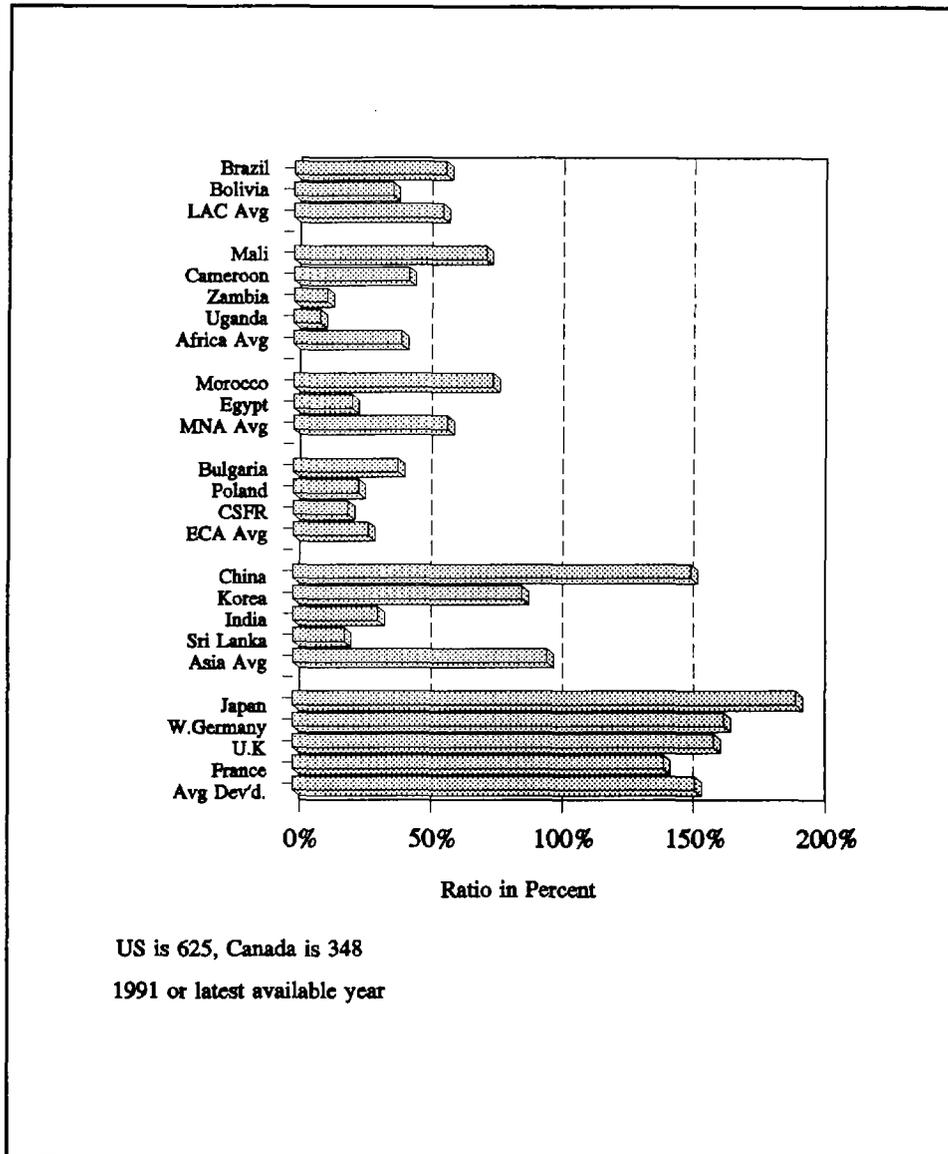
Rail share is strongly influenced by two apparent factors (among others), the length of haul and whether or not the economy is one of the formerly “socialist” or planned economies (see Box 7.6).^{31/} The significance of the government type and role will be discussed further below, but a high rail share will be significant in either context. A high rail share means that, in the first instance, the government will be cautious about embarking on institutional change because of the high risk to the economy if mistakes are made. Also, there will be few alternatives to rail in the short run because of the long time lags involved in creating highway or waterway capacity (unfortunately, the absence of competition also means that there will be less pressure on the railway to improve services and to lower costs).

A low and falling rail share will generally mean that there is more room for maneuver in railway change. It may also mean that the railway has already lost so much traffic, because of years of poor service and shipper relationships, that revival is unlikely and the option of closure or disposal to local authorities or to the private sector deserves serious consideration.

30/ It can be argued that many developing railways offer a considerably lower quality of service to their passengers and therefore should charge a lower fare. Anecdotal evidence seems to indicate that many railways offering 3rd and 4th class service reduce fares by even more than costs might fall: thus, the overall point of uneconomic passenger losses remains, or is even strengthened.

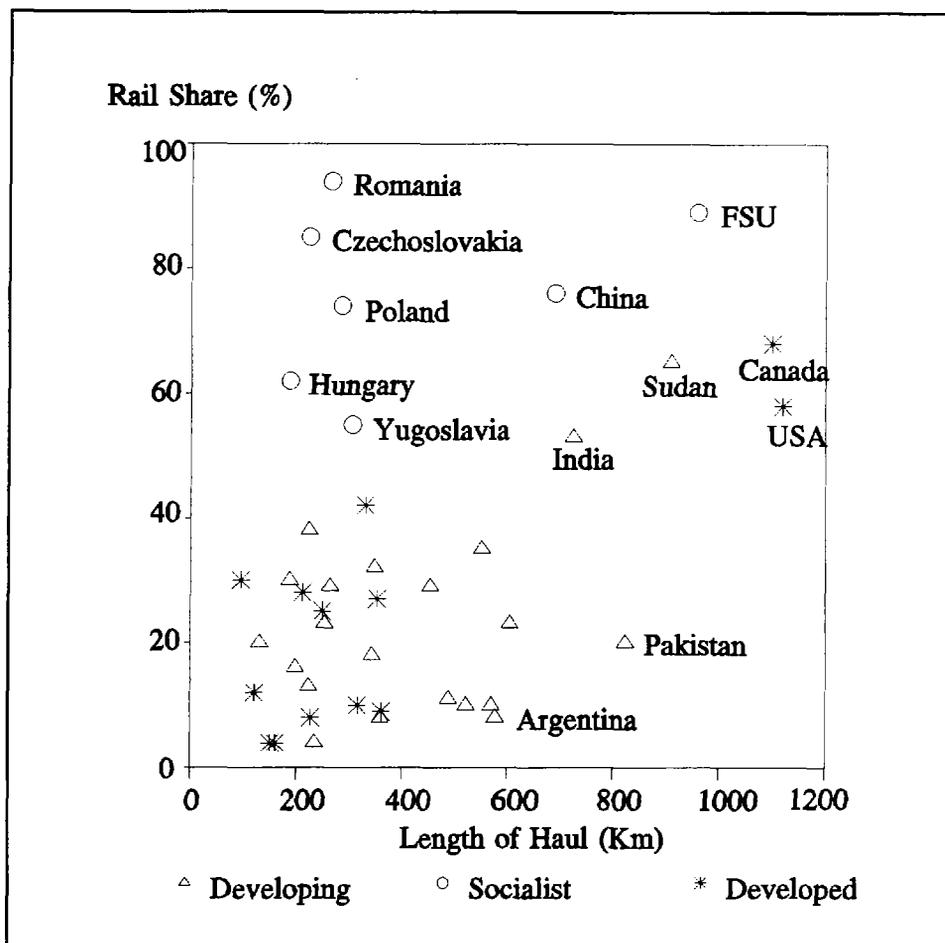
31/ See Bennathan, Fraser and Thompson (1992).

Box 7.5: Ratio: passenger fares to freight rates, (revenue/P-Km)/(revenue/T-Km)



Source: World Bank Railway Database.

Box 7.6: Rail share of rail + truck tonne-Km—1988 vs length of haul for developing, developed, and socialist countries



Source: Blackshaw and Thompson, 1993.

The relationship between railway and government will also have a significant impact on Bank lending. Although it is an imprecise and changing characterization, some borrowing countries have continued to operate until recently on a relatively rigid, planned basis: examples would be China, Viet Nam, to an extent India and, de facto, the current economies in the CEE and CIS countries. These railways play a role which is fundamentally different than in the more market-oriented economies. Although the railway's role in these countries may be suboptimum from a broader economic perspective, the railway can (often does) at least do a technically efficient job of fulfilling its assigned function (see productivity indicators in Annex B, Table B.2). In these circumstances, the Bank's planning emphasis should first be exerted in government ministries, and not the railway. Having reached whatever explicit agreement can be reached with the government's planning authorities as to the desired role for the railway, the Bank should concentrate its efforts on developing the best and most workable translation of

government priorities into well understood roles and objectives for the railway (and other modes). The Bank should then place its emphasis on developing within the railway those tools (network models, traffic flow models, traffic costing models, track capacity models, accurate financial reporting by activity), which will both permit the railway to operate more effectively under the existing ground rules and provide the essential support for better management under more market sensitive rules as that evolves. Capital investment priorities should be aimed at communications, signalling, and Management Information Systems (MIS), all of which permit improved use of existing capacity. Other areas of investment, such as improved and appropriate locomotive technology may also be beneficial. Except in China or possibly Brazil, there are not many instances where new rail lines will be needed. For these limited purposes, lending along the well established project model can be appropriate if the policy framework is clear and agreed. Of course, where further institutional development is possible, it should be vigorously supported.^{32/}

At the other end of the practice of "planning" is the situation where adequate competition from other modes already exists and thus the relationship between government and railway (and railway and competitive modes) should increasingly be governed by market forces, as in Argentina, Brazil, Chile, Mexico, Malaysia, or Korea. In these countries, although the economy may well continue to be more or less "guided," the railway can and should be left alone, and encouraged, to seek its own level in the freight area and possibly in the intercity passenger area, and increased involvement of the private sector can be encouraged. PSO responsibilities, of which some intercity services and commuter rail would be typical examples, can be defined and contracted by government with the railway (or with others). Otherwise, the railway can be given general objectives and authorities and allowed to succeed or fail.

The impediment to change in these countries is often in getting the government to the point where it will identify and tackle the problems of *transition*, especially redundant labor and the threat of some (usually exaggerated) localized disruption in transport services. The Bank's objective should be a thorough and open discussion of a realistic role for the railway based on the framework discussed above, and of how to make the policy choices needed to implement this role. In these economies, change can be attempted, and will have high benefits. Bank funding, at least during the process of decision and transition, should be concentrated on the costs of policy formulation and economic transition, especially labor redundancy, and should avoid large fixed investment; the Bank may also need to take a broader, sectoral focus in ensuring that the railway competes on a level field vis-a-vis other modes and that shippers (often government ministries) are free to generate the kind of market incentives to which the railway should respond. Experience has shown that the traffic patterns and priorities of a restructured, market-driven railway are sufficiently different from its government-managed predecessor that major investment decisions should be deferred until the reform process is well understood and well along.^{33/} In these cases, a broader vehicle than project lending will be needed. Sector lending will sometimes give enough perspective and leverage to achieve broad government commitment; in other cases, adjustment lending instruments will be necessary, both because adjustment loans can cover all aspects of the change

32/ For a more detailed discussion, see Blackshaw and Thompson (1993).

33/ These conclusions are especially relevant to the dramatic changes being made in Central and Eastern Europe and, *a fortiori*, in the CIS countries.

needed and because they can attract an audience at the appropriate (high) political level. Public enterprise reform loans in particular have, in many cases, provided a forum for such restructuring.

As usual, there is an in-between group which, for lack of a better term, could be called "interference" economies. In these, while the government does not impose a clear or planned role on the railway and run it directly as a government ministry, neither is it willing to let the railway manage itself against broad economic or financial objectives. This is because the government is unaware of, unwilling, and/or unable to make the policy choices which would be necessary for railway autonomy. The railway (and most other public enterprises) thus occupies a position in which the government constantly interferes in decisions at almost all levels but, at the same time, publicly holds the railway responsible for the "railway's" shortcomings. The interference can be direct: making the railway part of the civil service, subjecting the railway to government procurement rules, constant political pressures to hire individuals or steer contracts, or interference in rate and tariff setting. Interference can also be indirect, as happens where officials in the agriculture ministry, for example, make arbitrary decisions as to which mode to use for shipping imported wheat, or when competing transport companies are owned by government officials or other government agencies and traffic is routed away from the railway by fiat. Examples of "interference" economies would include Nigeria, Kenya, Zaire, Zambia, Pakistan, and Colombia (before the recent re-examination), among many others.

Not surprisingly, these countries tend to show up as weaker performers in Tables B.1 and B.2 in Annex B. These are the countries in which the conditions for poor performance outlined above are the most deeply rooted, and in which change will be both the most difficult and the most important. They are also the countries in which railway lending is the most risky, not just because the technical objectives of the loan are the most likely to fail, but also because actual harm can be done if the railway is in worse shape after Bank lending than before (if the improved productivity which was expected to support repayment of the loan does not materialize) and has even less ability to repay the prior loans.

The challenge in these countries is *to try to bring about the conditions of disengagement between the government and railway*. In doing so, the broader adjustment lending vehicles may be the best means available to get attention and agreement at a high enough level to permit all of the required changes to take place. When proper agreement is not possible, then Bank lending should be restricted to the absolute minimum needed to initiate or maintain a dialogue with the country, to attack crucial issues where the payoff is high and success certain, or to provide managerial tools, such as an appropriate MIS, which will be needed when the conditions for better management do arise. Absent, clear and demonstrated willingness to change the government/railway relationship, *experience in these circumstances has shown that any money loaned will often be wasted, or even harmful*.

The role of up-front conditions is also related to the change being sought. Loans with primarily technical objectives in "planned" railways (e.g., China) have a relatively high record of success, at least in their own terms. Allowing for the probability of frustrating bureaucratic delays, conditions which the railway accepts will generally be met and a project loan without major up-front conditions will be acceptably administered. By contrast, up-front lending conditions associated with policy change are very different because they are so critically dependent on the will and capability of the government involved, as well as the railway. If the government really wants to bring about change, then up-front loan conditions may not actually be necessary (although they may be useful when the government wants to put

some of the political blame on the Bank), but there is every reason to include them anyway. If the government is not really committed to change, then the conditions will not be met no matter what their nature and, as has often happened, the Bank may not seriously try to enforce them. In either case, delaying a loan in order to ensure adherence to reasonable up-front conditions involving policy change will avoid a much more costly problem later.

In assessing significant railway reform lending conditions, the best proof of intent is performance, and one of the best indicators is attitude. If the government understands the changes needed, willingly undertakes a serious commitment, and gets on with the job, then Bank help has been earned. If the government is unwilling to define issues, or argues that the major issues are too "sensitive" to be openly discussed, then they are almost certainly going to be too "sensitive" to be resolved, and excuses will inevitably be offered in place of results. Major conditions, especially those related to policy and regulatory change (notably tariff freedom and PSO compensation) and labor redundancy, will either be secured up front, or they are not likely to happen at all. In the terminology used below, this means that the policy thrust of the Strategic Plan, as implemented by a Performance Agreement, along with agreed and committed programs for dealing with transitional costs, should be available before negotiations or Board presentation. Sizeable tranches should be designed to ensure that the momentum for implementation is maintained. If this is not done, then expectations should not be high.

There is no rigid formula for bringing about railway change. In summary, restructuring is based on four general outputs: a Strategic Plan (SP), a Performance Agreement (PA), a Management Plan (MP), and an Enabling Actions Plan (EAP). A detailed discussion of the process may be found elsewhere.^{34/} Details may vary, and some issues may be more effectively addressed in a different form or format than the one shown below. Wherever included, it is the total content that matters.

- **The Strategic Plan (SP).** A long range plan for the enterprise which relates the overall outlook for the national economy to the marketing plans for the railway. The SP identifies all significant policy decisions which bear on the performance of the railway, analyzes alternatives, and presents policy decisions.
- **The Performance Agreement (PA).** The PA is the formal statement of the expectations, authorities and obligations of the railway and government. If government lives up to its obligations, it has a right to expect railway management to achieve its goals.
- **The Management Plan (MP).** The MP is an *internal* railway document which defines the targets of each railway manager as they relate to fulfillment of the goals in the PC. The MP contains the technical performance measures (locomotive availability, equipment utilization, line of business profitability) which the chief executive of the railway needs in order to evaluate railway management. These targets should not be in the SP or PC as commitments of the railway.

34/

See Huff and Thompson (1990), a report which was prepared under the auspices of, and with the support of, the Sub-Saharan Africa Transport Program.

- **The Enabling Actions Plan (EAP).** The EAP is an action oriented list of outputs (legislation, regulatory change, budget allocations) necessary to implement the planning process.

There are also a number of alternative approaches^{35/} to the question of how the railway should be organized to meet the need for more market-oriented services. Historically, railways throughout the world developed as monolithic organizations, controlling their own facilities, performing all operating and administrative functions, and unilaterally determining what services to provide to an often captive market. Such an evolution faithfully reflected the conditions of the times. In the nineteenth century, railways represented the vanguard of technology; they could reliably depend only on themselves to produce most of their material needs. Moreover, as the dominant means of overland transport, railways from their inception could essentially dictate the products they would offer (without much regard to customer preferences) and the prices they would charge (without attention to cost considerations), subject only to any available intramodal competition. Acknowledging this monopoly status, regulatory structures arose to control it, and in many countries perpetuated the illusion of monopoly long after competing modes had emerged in the transportation marketplace. In the socialist economies, the adoption of central planning reinforced the railway as a unitary organization. Throughout the world, therefore, autarky and monopoly produced and preserved the railway monolith.

In most countries, the production, market, and political conditions originally favoring monolithic rail transport entities no longer exist. Although constantly evolving and improving, railway technology is esoteric no longer. Railways are increasingly able to rely on a host of outside suppliers and service organizations to perform infrastructure, maintenance, administrative, and even operating functions, as dictated by economic considerations. Moreover, in the presence of mature, competing transport modes, railways can no longer be oblivious to customer preferences in designing services, nor can they price services without regard to their costs. Finally, the extreme centralization of all economic decisions that formerly characterized the socialist states (and their railways) is dissipating. In light of all these changes, the traditional unitary railway—in which the lowest official dealing with both revenues and costs may well be the general manager or the president—has become incongruous, and not just from a theoretical viewpoint.

In many countries, the mismatch between what the railways offer and what customers want has caused both pronounced economic inefficiencies and severe financial strains for the railways and their government owners. In much of the world, the railways' losses of market share, burgeoning deficits, and mushrooming demands for State funding have led to enormous pressures on governments to effect a fundamental restructuring of the railway entity itself, and of its relationship with the State.

These underlying pressures may manifest themselves in explicit and implicit government objectives for reshaping the railway. Typical objectives may include:

- Improve economic efficiency;

^{35/} See Moyer and Thompson (1992).

- Reduce railway deficits and government funding burdens;
- Promote creative and aggressive management;
- Allow and encourage the railway to function as a market-sensitive, commercial enterprise;
- Enhance intramodal or intermodal transport competition;
- Obtain improved management information and performance evaluation through financial separation;
- Equalize conditions for rail vis-a-vis other modes;
- Increase the role of the private sector in railways;
- Foster public policy in planning and national development; and
- Shake the foundations of the old railway order and its entrenched interests.

One approach—"separation" of fixed facility ownership from train operations—has gained prominence in recent years as a response to some of the objectives above. *This emphasis on "separation" has, to some degree, misrepresented and oversimplified the issue.* In fact, a full continuum of options exists for reshaping the railway entity. In any country, the aptness of each option depends on the relative weight and urgency of governmental objectives; on the relative importance of the various markets served by the railway; on the available technology; on the scale of railway operations as a whole; and on the administrative capabilities of the government and of the railway. Moreover, in practice, the vastly complex three-dimensional matrix of operating functions, service types, and geographic zones that characterizes mature railway systems may call for a sophisticated *combination* of restructuring options, rather than for any single solution. One option might be chosen for freight (or freight sub-markets), another for intercity passenger, and yet another for suburban passenger.

The Generic Options

In essence, each option expresses a possible set of relationships between the railway entity/entities, the markets served, and the functions performed. Indeed, today's railways perform a wide range of rail transportation services. Typically, this range includes intercity passenger, suburban passenger, and freight markets; each market can, in turn, be further categorized (for example, into "for-profit" and "not-for-profit" segments; by geographic region, line, or city-pair; by class of service for passenger; and by commodity or service characteristics for freight). In serving these markets, regardless of the level of service differentiation, railways must somehow manage the following basic functions:

- Ownership, improvement, and maintenance of fixed facilities;
- Control of operations (i.e., dispatching);

- Train movement;
- Equipment provision and maintenance;
- Marketing; and
- Financial control and accountability.

Option 1: The Monolithic Railway (Status Quo Option). Traditionally, the monolithic railway was almost wholly production-oriented, and was organized so that each functional department exercised total and undifferentiated responsibility over all services. For example, a single department might control maintenance of all coaches, wagons, and locomotives; or the train movement department might maintain a single roster of employees who could be assigned indiscriminately to freight, intercity, or suburban passenger jobs.

Option 2: Lines-of-Business Organization. As markets, technology, and operating practices have evolved, even on monolithic railways, commonality has diminished to a surprising degree among many of the assets and resources used in different markets. Thus, for instance, electrified suburban passenger services employ self-propelled, multiple-unit coaches necessitating specialized workshops; tracks with heavy commuter flows tend not to have much freight. Advances in management information systems have, furthermore, improved the accuracy and timeliness with which direct as well as remaining common costs can be assigned to particular services. These two converging trends have enabled railway entities to reorganize themselves (to varying degrees of depth) according to lines of business so as to foster comprehensive business planning, market- and cost-sensitive decisions, and more responsive operations for each service performed. In essence, this is an option for making the monolithic railway less monolithic in a service, if not in a production sense, while reducing the entity start-up costs implicit in other alternatives.

Option 3: Competitive Access. Under this option, competing railway companies would have exclusive control over some trackage, but would also have (and give) the right of competitive access over the trackage of (to) other companies. One variation within this option would be a “regional overlap” approach, wherein regional (or national) operators would be given the right to operate over tracks leading to major traffic centers in adjoining regions (or countries). Smaller-scale options such as trackage rights and joint terminal agreements provide miniature examples of the competitive access approach.

Option 4: The “Wholesaler.” The railway entity would own and operate the fixed facility and perform all operations on behalf of marketing entities who would be the “retailers.” This would mean that the railway itself would only haul trains; it would do no marketing to shippers. It might furnish some, or all, of the rolling stock and crews, at the retailer’s option.

Option 5: The “Toll Rail” Enterprise. The entire fixed facility (track, signals, communications, electrification, and so forth), except for exclusive facilities, would be the property and responsibility of one owner. There could be one or more authorized user(s), each of which would pay tolls for use of the facility. The tolls would be public and non-discriminatory, but might well vary by train size, axle load, direction of travel, time of day, season, and similar criteria. In a sense, the toll rail enterprise would be much like a regulated public utility.

For each of the above options, Table 7.1 shows how functions would be assigned to entities, and Table 7.2 refers to examples among today's railways.

Table 7.1
Assignment of Functions to Entities under Reshaping Options
(Note: In any one country, options can be combined or altered to fit conditions)

Function	Options				
	(1) Monolith	(2) Lines-of-Business	(3) Competitive Access	(4) Wholesaler	(5) "Toll Rail" Enterprise
	R=Railway	R=Parent L=Line of Business LP=Primary Line-of-Business	R1=Owning Railway R2=Railway having Trackage Rights	R=Railway W=Wholesaler	F=Fixed Facility Owner O=Operator
Fixed Facility Ownership	R	R (parent)	R1	R	F
Fixed Facility Maintenance	R	LP	R1	R	F
Operations Control	R	LP	R1	R	F or O
Train Movement	R	L	R1, R2	R	O
Equipment Provision	R	L	R1, R2	R (W) ^{1/}	O
Equipment Maintenance	R	L ^{2/}	R1, R2,	R (W) ^{1/}	O
Marketing	R	L	R1, R2	W	O
Accountability	R	L	R1, R2	R, W	F, O

^{1/} In this case the railway would normally be the primary supplier, but the wholesaler could well be an optional source of supply for railway rolling stock.

^{2/} Where one line of business performs equipment maintenance for another, internal charges would be reciprocally assessed.

Source: Moyer and Thompson, 1992.

Table 7.2
Examples of Reshaping Options

Options	Examples ^{1/}
(1) Monolithic Railway	Bolivia, China, Russia, Zimbabwe
(2) Lines-of-Business Organization	British Rail, RENFE, ^{2/} United States (as a whole: freight railways, Amtrak, commuter authorities)
(3) Competitive Access	Canada (freight; CP and CN are to operate over some parts of each other's track); United States (trackage rights and joint terminal agreements); Council of the European Communities' directive (competitive access concepts)
(4) "Wholesaler"	American President Lines (double stack), Norfolk Southern Triple Crown, haulage agreements, Australia, CONCOR of India
(5) "Toll Rail" Enterprise	Amtrak, Japan Freight Railway Company, Japan's Shinkansen services, Swedish Railways (SJ)/Banverket

^{1/} Not all these examples are discussed in the text of this paper.

^{2/} Spanish National Railways.

Source: Moyer and Thompson, 1992.

Issues

In evaluating these options, railway planners need to consider a series of issues that reflect both actual experience and *a priori* analysis. The list of issues below is indicative, not exhaustive; not all issues will apply to all options. As evidenced by successful initiatives in such countries as the United Kingdom, Canada, Japan, Spain, and the United States, these issues do not constitute insuperable obstacles to reshaping railway entities.

- **Market Definition.** Will the resultant entity/entities have a clear and better view of the markets they serve and the full impacts of their business decisions on those markets?
- **Financial Accountability.** Will mechanisms exist to fix both cost and revenue responsibility at appropriate locations in the organization(s), so that effective business planning and decisions can occur?
- **Operations Coordination.** If the monolith is divided, what mechanism(s) will be established to resolve the inevitable operating conflicts among entities, or even among lines of business subsidiary to a single entity? Will the option in and of itself minimize or exacerbate such operating conflicts?

- **Intramodal Competition.** Does the option permit an appropriate level of intramodal competition?
- **Appropriate Maintenance Levels.** Will the option encourage or discourage continuous maintenance of the fixed facility at a level of utility that *fully satisfies, but does not exceed*, the needs of users?
- **Track Maintenance Coordination with Operations.** How will the safety and work efficiency needs of the entity maintaining the track be reconciled with the needs of other entities for timely, unrestricted access to fixed facilities?
- **Private Sector Development.** Will the option afford an opportunity for increased involvement of the private sector in railway transportation?
- **Startup/Transaction Costs.** Do the initial costs of implementing the option, and the administrative costs of perpetuating it, outweigh its likely benefits?

Table 7.3 evaluates the generic options in very broad terms according to their responsiveness to each of the issues. As might be expected, the *monolithic railway* rates high on apparent technical efficiency (since conflicts are decided by executive fiat and transaction costs are minimized), but low on marketing effectiveness considerations. The *lines-of-business* option offers improved responsiveness to markets and accountability, but reflects increased operating conflicts and transaction costs as the monolith becomes divided. The *competitive access* option introduces intramodal competition in selected markets, while maintaining unitary control over most railway operations. Unless the distribution of “franchises” is self-balancing, providing clear benefits to all participants, the owning railways are unlikely to permit a serious level of competition in markets which they have traditionally controlled. Thus, competitive access is often an evolutionary approach. The “*wholesaler*” option should accomplish an excellent marketing job, but the actual operation would remain in monolithic hands. Finally, the “*toll rail*” *enterprise* might come closest to reflecting a theoretical model of marketing effectiveness; yet it would generate potential operating conflicts and higher transaction costs. This option would also call for the highest degree of administrative capability in the owning government.

Circumstances differ in every country and for each railway. Since the relative values applied to each objective (row) in Table 7.3 will vary by country, the ratings shown in each column cannot simply be added together to determine an optimum. Thus, no *a priori* conclusions are possible as to which generic option (or combination) would be “best” in a specific circumstance. Nevertheless, certain country types and railway characteristics would, in principle, lend themselves most readily to certain reshaping options. For example, a monolithic railway might be an appropriate choice for a fully planned, command economy (or for a true single purpose operator such as a mining evacuation railway)—although a desire for better measurement of performance might lead to a line of business organization even in these circumstances. Economies in transition, small railways with a restricted number of customers, or larger railways seeking to depart incrementally from a monolithic framework, will probably find a line of business organization to be a useful first step. A need for *intra-modal* rail competition, either in large countries with well developed rail systems or in adjacent countries with integrated economies, could promote greater use of competitive access solutions, as in the European Community’s recent order.

When customer service quality needs are paramount (as in container landbridge services or in certain unit train applications), or when the rail service is driven by external requirements (as in container dry ports), it may be best if the railway is a "wholesaler" selling to a "retailer" who relates directly (and more effectively) with the customer. Finally, where a rail service is easily separable from other services, and where the service does not conflict heavily with other services, a "toll rail" enterprise solution may be desirable. Examples of this possibility are Amtrak, VIA and the Japanese Rail Freight Corporation.

Table 7.3
Characterization of Generic Reshaping Options

(Options are rated High (H), Medium (M), or Low (L) according to their responsiveness to each issue. The characterizations are for generic options and would naturally vary with the particulars of specific options scrutinized.)

Issues	Options and Characterizations				
	(1) Monolithic Railway (status quo)	(2) Lines-of- Business Organization	(3) Competitive Access	(4) "Wholesaler"	(5) "Toll Rail" Enterprise
Market Definition	L	H	M	H	M
Financial Accountability	L	M or L	M or L	M	H
Ease of Operations Coordination	H	M	M	M	L
Intramodal Competition	L	L	H	H	M
Appropriate Maintenance Levels	M	M	M	M+	? (Depends on pricing)
Track Maintenance Coordi- nation with Operations	H	M	M	M	L
Private Sector Development	L	M	M	H	H
Start-up Problems and Transaction Cost Burdens	L	M	M	M	H

Source: Moyer and Thompson, 1992.

Underlying all these issues and options is the basic tradeoff between traditional measures of efficiency of production and effectiveness in meeting market needs. The traditional monolithic railway, organized in a strictly hierarchical pattern along departmental lines, is geared to producing maximal amounts of relatively undifferentiated output with minimal inputs. However, what the customer wants

and what the competition will provide do not necessarily mesh fully with the railway's technical production efficiency. Thus, by contrast, the reshaped railway—whatever the depth of the attempted restructuring—seeks to serve each market in a manner that maximizes either profits or other benefits dictated by its agreement with the State. Regardless of the precise objective, a market-sensitive railway might appear to be less “efficient” than a well-managed monolithic entity in terms of production, and yet be much more effective in fulfilling its goals of improved service quality and commercial performance because the customer is interested in minimum logistic costs, not just the lowest railway rates and minimum service quality.

For example, a reshaped railway will typically establish separate “commercial” and “noncommercial” lines of business. The former would be operated on a commercial, for-profit basis and would be self-supporting and generally unregulated; the latter would be operated under contract with government at some level(s), and would receive operating subventions under the “public service obligation” (PSO) rubric. This dichotomy would free the railway to operate as a commercial enterprise by reducing the government's span of control to separable PSO functions only, and would encourage both railway and government to view PSO functions as a business relationship between customer (i.e., government) and contract supplier (the railway). By the railway's traditional measures of technical operating efficiency (e.g., coach-kilometers per locomotive-kilometer), the restructured services, taken together, may fall below historical levels. This decrease, however, may mask a host of steps taken by the respective lines of business to boost the responsiveness of each service to customers' needs and willingness to pay. The result should be a more profitable railway in the case of commercial services, and noncommercial services that better fulfill explicit public policy objectives—in fact, a more truly economically, efficient railway.

The concept of the railway as a unitary entity is so strong and self-perpetuating in many countries as to form a roadblock against reshaping the railway in ways akin to those broached in this paper. Yet, such reshaping *has already taken place* with success in the U.S., Canada, Japan, Sweden, Finland, Argentina, Spain, and New Zealand among others, and offers clear promise elsewhere. Technology, competition, and historical forces have eroded the foundation of the unitary railway; rail entities that are driven by production rather than market considerations are no longer necessary. As a result, where incremental approaches are feasible, transition to some form of lines-of-business organization would be a useful first step in bringing the market to the railway. Such a reorganization, whatever its depth, would improve market definition and financial accountability without undue startup and transaction costs. Following the example of British Rail, the lines-of-business strategy could be intensified in stages.

Reshaping need not stop with lines-of-business, however. Where incremental approaches have not worked, cannot work, or have reached the limits of their effectiveness, the full spectrum of options exemplified in this paper will merit careful consideration. Experience has clearly demonstrated the feasibility and desirability of mixing and matching these options to fit national needs. Experience has also shown that, despite the difficulty of making valid generalizations, one broad statement can be made: *the monolithic railway simply does not function well in a market economy in competition with privately-owned, properly (i.e., lightly) regulated competitors—especially trucking.* All attempts to “commercialize” or “corporatize,” or to increase the role of the private sector in railway activities, have started with one or another form of reshaping of the railway entity. Thus, while the detailed solution will

vary from one country to another, as an economy becomes more market-driven with wider competition in the transport sector, the need to reshape the monolithic railway into a market-sensitive transport entity remains a vital and universal objective.

Where institutional change is the objective, *the role and form of technical assistance also need to be carefully examined*. Absent institutional change, the rather automatic prescription of technical assistance can be an exercise in futility when the railway lacks the incentives to ensure that the expertise to be transferred is either understood or put to use. Examples are common of situations where: training courses are seen by railway and employees as a reward or vacation—the employee is not really expected to acquire skills and is often transferred to an unrelated job upon return to country; the employee learns, for example, how to repair locomotives only to return to a shop where there are no spare parts; employees learn how to construct and use traffic costing models but there is no interest in profitability analysis or pricing initiative; and technical assistance is in fact actually perverse, at least for the railway if not the overall economy, because trained employees immediately leave for employment in sectors which are not subject to artificially-suppressed civil service wage levels.

This is not to say that technical assistance is not needed for restructuring; it is, but of a different type. The focus should be on the skills appropriate to the *policy* framework. “Planned” railways may still properly acquire and employ technical training. Market-based railways badly need to command the issues of strategic planning and management under competition; technical skills should follow when they are needed and when they will be effectively used and maintained. Except in carefully focussed cases, “interference” railways are not likely to take full advantage of training.

Lending to promote institutional reform or achievement of environmental objectives, including a greater role for the private sector, is unusually intensive of staff time, and will not happen fast. The Bank will need to be prepared to devote a great deal of effort at the highest levels to getting the process started, and at all levels to ensuring that the planning and policy formulation effort is done well and is accepted. Supervision effort is also likely to be high because it is so difficult to get and keep the process on track. It will likely take several loans over a period of years to get results—but this is probably the only hope of real improvement. When countries are unwilling to try an appropriate reform or restructuring program, the Bank (except for the narrow purposes discussed above) should be unwilling to make loans in the railway area and possibly elsewhere in the transport sector. If the macroeconomic effects of the railway are sufficiently large and adverse, as was the case in Argentina (and as may well be the case in the CEE economies when the true costs and revenues become known), then a commitment to change in national railway policy could well need to be a central part of the Bank's overall country strategy.

ANNEX A

RAILWAY RESTRUCTURING EXPERIENCE IN THE DEVELOPED COUNTRIES

The U.S. Experience

The U.S. is unusual in that all of its railways (there are about 12 Class I railroads in the U.S.—companies with more than US\$60 million per year in revenues—and several hundred smaller companies) had long been privately-owned and operated. At the beginning of the development of the railway system in the U.S. (in the 1820s), the railways essentially enjoyed a monopoly in land transport, but faced a great deal of intramodal competition. Being a high fixed cost, low variable cost operator, the railways necessarily engaged in a pervasive system of actual (or perceived) discriminatory pricing based on the “what the market will bear” principle. There were those being discriminated against who objected to the practice, and those desirous of receiving the benefits of imposed and favorable discrimination who wanted to take advantage of the system. There were also others who wanted stability and predictability in rates, no matter what their absolute levels.

The result of the growing political resentment of railway pricing was the initiation in 1887 of regulation aimed at correcting these “abuses,” and the establishment of an unshakable political myth (partly true, as most myths are) that the railways were arrogant and powerful, deserving of suspicion and, because of their great market power, able to carry any politically imposed burden. On this foundation the regulatory system continued to build increasing controls over railway actions and impose additional burdens (reduced fares, reduced agricultural rates, imposed passenger services, refusal of permission to abandon branch lines, etc.), all of which were expected to be covered through cross-subsidy. This policy continued essentially unbroken until the emergence of competition (primarily trucks and the auto, but also buses, airlines and federally subsidized water transport) eroded the underlying assumption—that there was profitable traffic available to generate the surpluses needed to fund the imposed subsidies. The high water mark of the regulators was the late 1930s, although World War II, by freezing the modal shift away from rail which had been taking place, gave the railways a five-year respite.

The myth died hard, and it was not until the early 1970s that the worsening condition of the private railways forced the government to realize that change was necessary. The first result was the removal of intercity passenger service deficits from the responsibility of the private railways. The government created Amtrak in 1970 and gave it responsibility for operating and funding all intercity passenger services. Amtrak is organized and managed as a private corporation whose stock is owned by the federal government. Its Board of Directors is appointed in accordance with a series of guidelines established by law. It receives capital and operating payments from the federal and state governments to operate services mandated by law. In all other respects, including relations with its employees, Amtrak operates as a private corporation.

Amtrak has been a costly endeavor, requiring over US\$19 billion in total funding in the 20 years since its inception. Despite the cost, Amtrak is generally considered to have achieved its goals, which were to let the private railways concentrate on freight, to put decision-making and funding responsibility for passenger service where it belonged, in the public sector, and to stabilize passenger services and make up for the years of funding neglect caused by the inability of the private railways to carry the burden.

Creation of Amtrak could not by itself resolve the U.S. crisis. In 1970, the Bankruptcy of the Penn Central Railroad^{1/} and six other railways in the Northeast and Midwest rapidly confronted the U.S. government with the threat of cessation of a major part of the rail service in these regions. The crisis was sufficiently intractable that the government was forced to nationalize and combine the 7 railway companies (creating Conrail), and embark on a long program of system planning, rebuilding and operating support. After eight years of federal ownership during which Conrail, like Amtrak, was allowed to operate essentially without government interference in management decisions, it became clear that the railway malaise had causes more serious than access to funding alone could cure. Conrail was especially important also, because it made the high cost of adverse regulation clear and immediate: costs imposed by government policy through regulation were paid immediately out of the government budget through subsidies. The problem was no longer politically free.

The third and critical initiative was deregulation of freight traffic for both railways and trucking, sweeping away virtually all of the arbitrary barriers to market-responsive decision-making which had been erected over the 100 years of regulation. By freeing up ratemaking, entry and abandonments, regulatory change acted to increase revenues *and* lower rates, reduce costs and improve productivity for both rail and trucks. Twelve years after regulatory modernization, railways are generating much-improved profits and have a much better safety record, even though rates are actually *lower* (in current as well as constant terms) than before deregulation.

The Conrail restructuring required two further adjustments. In 1982, the burdens of operating local commuter passenger services were transferred to local and state government, and the labor unions (reluctantly) accepted the need to reduce the size of Conrail's labor force, in return for fair labor severance payments. After these changes, Conrail became profitable and was returned to the private sector in 1987 via a public stock offering. Like Amtrak, Conrail was a costly process, with a net cost to the federal treasury of US\$6 billion. Also like Amtrak, Conrail ultimately achieved its objective of re-establishing stable rail service in its service area (the Northeast and Midwest U.S.). Conrail had an unintended, major benefit in the push its dilemma gave to the political process in resolving the much deeper and more serious problem of adverse regulation.

Experience in the U.K.

In many of its broad aspects, experience in the U.K. was similar to that of the U.S.^{2/} Both countries saw the early rise of private sector rail systems whose commercial approach was necessarily rooted in a system of discriminatory pricing. Both countries erected elaborate regulatory frameworks which engaged in systematic intervention in the market and in management decision-making. Highway-based competition emerged in both countries at roughly the same time and for the same reasons, although the differing economic structure and geographic scale caused the railway freight role in the U.K. to fall much farther and faster than in the U.S. Both countries saw a physically weakened and financially threatened railway system emerge from WWII. They differed in that the U.K. deliberately chose to nationalize its railway system.

^{1/} See Beshers (1989).

^{2/} See Reid (1989).

Upon nationalization, the scene was simplified. There was one rail carrier (British Rail, or BR), which was engaged in freight transport and was the predominant intercity passenger carrier. There was one major common carriage, long haul truck carrier, ultimately called British Road Services (BRS). There was also a large bus carrier which was engaged in intercity and urban passenger transport and lighter density rural services, but was not an effective competitor to BR for intercity passenger traffic.

Many reasons have been advanced for the pressures for change which began to build in the U.K. immediately after nationalization. One reason, in particular, seems clear: the combined effects of the shift of traffic from rail to truck resulting from the ending of the wartime traffic restrictions and the growth of rail/truck competition were harming BR. The British Government came to realize that adverse policy and regulatory decisions were expensive, and had to be paid directly by the government as owner and operator. As with the U.S., the cost had become clear and immediate.

Three major pieces of legislation were enacted to change the system of regulation and railway objectives, the Transportation Acts of 1953, 1962 and 1968. In addition to the legislation, a report prepared by Lord Beeching established the basis for viewing BR as a manageable, economically and financially driven enterprise. In sum, these initiatives deregulated BR, gave BR a set of physical and financial objectives (although these objectives required years to be refined) and deregulated trucking. In the ensuing years, BR concentrated more and more on clarifying its role as between its commercial (unsupported) businesses and its Public Service Obligation (PSO) activities which were always recognized as needing public financial assistance.

Beginning in the term of Sir Peter Parker as Chairman of the British Railways Board, BR came under increasing pressure to minimize its requirement for public funds, and BR and the Government began to develop more specific agreements as to roles, authorities and responsibilities. The current relationship, which dates from 1982 during the term of Sir Robert Reid as Chairman, is governed by an understanding between BR and government which provides, essentially, that BR will be generally free to manage its business, in return for which a targeted reduction in public funding requirements will be met. The changes beginning in 1982 were given added impetus by the Serpell Report, the product of a publicly-appointed committee with the task of identifying changes and policy initiatives needed to reshape BR's future prospects. Among other things, this report recommended a specific agreement between government and BR which would contain well-defined objectives and monitoring procedures.

In meeting the terms of the improved agreement, BR organized itself into five separate lines of business, each of which is a "profit" center: freight (which is unsubsidized and unregulated); intercity passenger (unsubsidized and unregulated); Provincial Services (commuter and light density services which are regulated and subsidized partly by the National Government and partly by local governments); London and Southeast (commuter services regulated and subsidized by the National Government); Parcels (unregulated and unsubsidized); and other corporate activities, such as real estate development, which are unsubsidized and unregulated. Subsidies are paid through what has become known as the Public Service Obligation (PSO) grant, a budgeted set of payments to cover the losses associated with providing services which are unprofitable.

As a result of regulatory and institutional change, BR can show, by all objective measures, major achievements. In October 1983, BR was given the objective of reducing its PSO grant by 25 percent over three years, and of operating freight and parcels services on a commercial basis. These objectives were in fact slightly exceeded. In October 1986, BR was given the objective of reducing the

PSO grant by a further 27 percent, and of adding intercity passenger service to the list of fully commercial (non-subsidized) activities. These targets were, again, effectively met, by and large through cost reduction and productivity improvement and not through significant real fare increases in a monopoly market. Overall, despite the trauma of the cultural change involved in converting from a production-to a marketing-oriented railway, BR appeared well along on the road to sufficiency in the commercial areas, and has developed a clear, agreed, effectively performed role in the PSO areas.

The British Government is now embarked on a radical program of "privatization" which will, at the very least, transform BR once again. While the final shape of the change is not yet clear, the broad thrust is to separate BR into a fixed asset owning and operating company, and a series of operating companies. The asset company will own, maintain and schedule operations of its track. It will charge usage fees based on agreements with the operating companies (it is expected to be mildly profitable) and will charge for access based on a complicated system of negotiations or quasi-auctions. It is eventually to be privatized, but no time frame has been decided. The operating company structure is not clear. There will probably be one freight company sold as a competitively awarded franchise. There will be a number of intercity passenger franchises depending on private sector interest; shorter haul passenger franchises will also be awarded based on a "minimum PSO required" basis. The time frame for the completion of these transactions is also not yet (as of May 1994) announced. Whatever happens, BR will not remain in its present form, but this should not detract from the progress which had already been made.

Experience in France

There are many parallels (and inevitable differences) among the railway developments in France, the U.K. and the U.S. France itself went through a period of financial and managerial dissatisfaction with its national railway (Société Nationale des Chemins de Fer Français, or SNCF), a problem which had parallels throughout the French system of nationally owned and managed enterprises. In 1967, a well known French official, Simon Nora, was asked by the government to prepare a report on the issues of improving the management of national enterprises. His report (commonly known as The Nora Report) recommended the development of formal agreements ("Contrats") between government and enterprises specifying clearly and in detail the objectives, authorities and responsibilities of each. The objective of these agreements was to reduce or eliminate the confusion as to the role of the enterprise, to reduce government interference in affairs for which management was to be held responsible, and to make it possible to hold management accountable for meeting objectives. SNCF was one of the first enterprises to sign a performance agreement (contrat plan).

"Contrat plans," or performance agreements^{3/} as they have become generically known, have gone through a long process of evolution in France, an experience which is exemplified in the SNCF

^{3/} The term "contract," although a literal translation of the French "Contrat," can be deceptive. In no sense is this a contract in practice, since the enterprise has no real (or safe) remedies at law to correct government non-performance, and the government has no need of the contract if it wishes to correct non-performance by the enterprise. A more precise term, at least in English, would simply be "agreement," from which the term performance agreement has been developed.

results. As might be expected, the initial attempts were overly detailed and inflexible (because those drafting them had primarily public sector, accountability oriented backgrounds rather than private sector, result-oriented backgrounds). Unexpected events, such as the oil crisis of 1973, played havoc with the agreements, and caused them to be suspended while their objectives were reexamined.

The French made good use of experience, however. In later performance agreements (SNCF has signed its fourth agreement which extends through 1994) SNCF and the government have placed greatly increased emphasis on the *planning* aspects of the relationship, and have viewed the “*contrat*” phase as a relatively mechanical process of implementing the plan. The favorable results of the performance agreement innovation are many. The process of developing the plan has vastly improved the amount and realism of communications between government and railway: it has been invaluable in forcing common assumptions, reducing wishful thinking, highlighting policy conflicts and clarifying the government’s responsibility for political decisions versus the railway’s responsibility for efficient operations. It has greatly improved the stability of railway planning and management because the railway has a 5-year horizon to work with. And, because it has clarified responsibility and authority, it has significantly improved the ability of SNCF to make decisions and thus for the government to hold SNCF accountable for those decisions. By defining capital and operating assistance explicitly by purpose, performance agreements have also greatly clarified the “*PSO*” function of the railway. SNCF ultimately came to be recognized as an effectively and professionally operated railway which is, in the case of the TGV, at the forefront of developments in railway technology.

At least until recently, however, the performance agreement process had rather less success at changing the underlying corporate culture of SNCF as a government-led agency, nor did it make steady progress at introducing any significant market-related influence on SNCF decision making. Although much clarified in a bureaucratic sense, SNCF continued to be organized as a traditional engineering driven, production-oriented entity, more interested in budgets, operations and construction than in overall commercial considerations. For example, its lines of business have not yet been seen as profit centers. The theme of the commercial function began to emerge in the late 1970s, however, and in later agreements, commercialization issues began to receive more attention. SNCF has recently announced a reorganization which is quite similar to that of BR in its focus on market lines of commercial activity rather than solely on operating considerations. Except in the freight area (in which SNCF has become one of the more aggressively commercial of continental railways) it is not yet clear what the impact of this restructuring will be. As with BR, the effects will undoubtedly take several years to emerge.

The Japanese Experience

Nothing elsewhere in the world compares with the sheer financial scale of the recent railway restructuring in Japan.^{4/} Much like railways in other countries, Japanese National Railways (JNR) gradually shifted after WWII from a mildly profitable position in the mid 1950s, to literally staggering deficits (over US\$13 billion in 1985) by the mid 1980s. Unlike other countries, the reason for the decline appears to have been less related to the emergence of competition or adverse regulation than it was to the focus of management on engineering and operating issues and a sheer indifference to budgetary considerations. As a result, JNR developed a bloated, unmanageable and unresponsive labor force, relatively poor services (except for the high visibility Shinkansen service, which is the equal of any of

^{4/} See Tanahashi (1992) and Fukui (1992).

the world's high speed services), and an accumulated debt of over US\$200 *billion* (over 7 percent of total Japanese GNP in 1987). Beginning in 1969, four attempts had been made to get control of the JNR deficits, all with no results, primarily because of political interference, a lack of a sense of crisis, and bureaucratic inertia. Deficits continued to mount, and change became imperative.

Because of the JNR problem (and other similar but less critical problems), the Japanese government appointed the Second Ad Hoc Commission on Administrative Reform in 1981, with the primary task of planning a course of action for restructuring JNR. The Commission concluded:

- There was good reason to believe that the JNR railway passenger business could be profitable if efficiently operated (like the existing and profitable private passenger railways in Japan).
- The prior restructuring initiatives failed because they attempted to make incremental changes within the existing framework rather than major changes in the framework itself.
- "...JNR was a public corporation ... running under rigid, nationwide operating practices. Under these circumstances a responsible, business-oriented management structure could not be established. With the prevailing management attitude that 'good old government will always foot the bill' successful JNR restructuring could not be expected."^{5/}
- Drastic reform was required. The railway needed to be divided into geographically based lines of business (primarily passenger-oriented) of appropriate size and managed along commercial, profit-oriented lines. These firms should be privatized as and when possible.

Following the themes of the Committee findings, the former JNR was divided into a number of new *corporations* (initially wholly government-owned):

- Six geographically based passenger railways were formed. The main island (Honshu) has three of them (East, West and Central Japan), and each of the other islands (Shikoku, Kyushu and Hokkaido) have one. The three main-island railways were expected to be profitable, and were not to be supported. Some of the existing JNR debt was transferred to them as they were expected to be able to carry it. The three smaller island railways were expected to be unprofitable, and a US\$10 billion trust fund (called the "Revenue Stabilization Fund") was established which will earn enough in interest to cover the deficits of the losing companies. The fares of all of the passenger railways are subject to regulation. The profitable railway companies are to be privatized as soon as their record of performance permits.
- One freight railway was created. This railway operates over the trackage of all of the other passenger railways, and pays a fee for doing so (the inverse of Amtrak in the

^{5/} Tanahashi (1992), p. 5.

U.S.). It is not subject to fare regulation, and is also expected to be at least marginally profitable.

- The Shinkansen (high speed lines) Leasing Corporation was established to own the Bullet Train right-of-way and lease it back to the three passenger railways which have high speed lines.
- The JNR Settlements Corporation was established to carry the burden of the untransferred debt along with all other unfunded obligations of the old JNR. These obligations included pensions and the cost of funding severance payments for all of the staff which remained after the new companies had selected the employees they needed. The Settlements Corporation was given all of the assets, especially non-rail real estate, which the new companies no longer needed. At its foundation, the Settlements Corporation had obligations of over US\$160 billion. It also will receive the proceeds from the sale of stock in any of the operating corporations. It is not yet known what proportion of the debts can be repaid from real estate or stock sales, but it seems clear that the government will be left with a significant residual obligation.

Initial operating results are encouraging. The larger passenger companies are, in fact, earning higher profits than originally projected, and the smaller companies are generating deficits within the ability of the Revenue Stabilization Fund to carry. The Freight Corporation has also been marginally profitable. Traffic for all three has exceeded projections. Railways operating profits have risen from a loss of US\$3.2 billion in 1986 (the last full year of JNR operation) to US\$4.7 billion in 1991, and the annual consolidated loss for the overall group has fallen by US\$10 billion from 1986 to 1991. Plans for “privatizing” the larger companies are proceeding and half of the stock in one of them (East Japan) was sold to the public in August 1993. The Settlements Corporation has not made much progress in selling its assets (because of a fear that asset sales would touch off another round of real estate speculation in Tokyo), but its obligations have worked out about as planned, and there are at least some observers who believe that the real estate will turn out to be much more valuable than earlier estimates had indicated.

However, the financial results eventually turn out, the restructuring must be judged a success in reaching the underlying objective, which was to change the mentality of the railways—to give them a reason to operate rationally and efficiently, to give better service to passengers and to stop blithely running up huge losses. This has happened, in all lines of activity, and seems likely to continue to improve. The government will, of course, have to pick up the debris from the earlier institutional catastrophe, but this was an obligation which already existed, and would have continued to deteriorate at the rate of over US\$10 billion per year, instead of the current need for roughly zero.

ANNEX B

RAILWAY COMPARATIVE PERFORMANCE: IMPLICATIONS FOR RESTRUCTURING

Few issues require more caution than railway statistical comparisons. Economic conditions, traffic characteristics and mix, labor conditions, topography, access to technology, cultures, and definitions of terms and reporting rigor (among many, many other factors) differ, and so do railways. Generalizations about railways, as with nations, are thus made with care. Tables B.1, B.2 and B.3 show data for a series of railways. Allowing for these qualifications, the Tables furnish a useful perspective on railway performance across both developing and developed country railways, and suggest the implications which railway scale and productivity have for the process of railway lending.^{6/}

First, there is an enormous variation in scale, for example traffic, with the smallest freight railway (Ethiopia, with 50 million tonne-km per year) carrying only .003 percent of the freight traffic of the largest (Russia). The smallest passenger railway (Gabon) carries .02 percent of the traffic of the largest (Russia). Employment in China and India added together is greater than all of the other railways in the world combined.

Productivity indicators are also significant in analyzing the need and prognosis for institutional reform. For example, one of the most important single indicators of railway management performance is locomotive availability. This measure, like others, is subject to manipulation and interpretation, so no significance can be attached to a difference of a few percentage points. Apparently, also, the African numbers are systematically biased by a tendency to keep inoperable locomotives on the asset roster because procedures for scrapping are inexplicably difficult. This bias might worsen some of the African numbers by 5 to 10 percentage points relative to other countries. With all these caveats in mind, the variations in locomotive availability in Table B.2 are still significant.

There is no absolute measure of adequate availability. Other things being equal, the figure should be as high as possible, and there is just no explanation for a very low number. Locomotives are expensive (well more than US\$1.5 million each) and they are literally the heart of the railway's productive capability: lacking available locomotives, neither freight nor passengers move. Railways in developed countries aim at an availability rate for diesel locomotives of at least 90 percent; electric locomotives should do better—94 to 96 percent. Developing railways cannot physically be expected to do quite this well because: 1) they face a longer spare parts pipeline; 2) their fleets are somewhat smaller than many developed country railways; 3) the depth of their technical support industry is not quite as great; 4) and, as in the case of India and China (and the CEE and CIS railways), indigenous locomotive designs are not quite up to the standards of Western European and North American locomotives. Many developing railways do meet or exceed an 80 percent level, and this probably represents roughly acceptable performance in their context.

From an overall point of view, in many of the Bank's borrowing countries the railway is a fully professional organization, at least as regards purely operational efficiency and managerial effectiveness measures. Table B.2 shows, for example, that the Maghreb railways compare quite favorably in

^{6/} The World Bank's Railway Database includes at least partial data for over 90 railways in more than 80 countries.

productivity, both for labor and capital, with the performance in Western Europe. China and India are, respectively, the third and fourth largest railway systems in the world and, making due allowance for differences in labor cost and access to capital, give little away in productivity comparisons. The same can be said of Mexico, Brazil (RFFSA and FEPASA) and Korea. These railways have already shown a reasonable ability to perform effectively *within the rules of the game as they see them*.

A particularly important difference is found in traffic *trends*. Certain developing countries (Gabon, Mali, China, India, Thailand, Korea, Egypt, Syria, and Morocco) show compound traffic growth rates greater than 2 percent over the period 1980 to 1991 for both freight and passenger. Of the nine developing railways to show vigorous traffic growth, two are in Africa, four are in Asia and three, in MENA—and none elsewhere. Six countries have seen their traffic *shrink* by more than 2 percent annually in both traffic categories (Côte d'Ivoire, Nigeria, Sudan, Zambia, Sri Lanka, and Colombia). In each case, the underlying cause is as much attributable to a collapse in the railway itself (locomotive availability around 30 percent) as to trends in the economy. Three other railways (Senegal, Portugal, and Uganda) show healthy growth rates in freight (above 5 percent), but do not meet a 2 percent passenger growth criterion; Cameroon and Mongolia had passenger traffic growth above 5 percent, but did not meet a 2 percent freight growth criterion.^{7/}

The relative role of passenger service, shown in Table B.2 as the percentage of total traffic which is passenger traffic ("Pass-Km as % of Traffic Units")^{8/} is another significant indicator with implications for the type of institutional change which may be needed. Analysis of the Railway Database indicates that a passenger-kilometer characteristically requires more of *all* resources (labor, locomotives and coach investment) than does a freight tonne-km.^{9/} At the same time, developing countries show a strong tendency to charge significantly less for a passenger-km than for a freight tonne-km, whereas most developed country railways charge significantly more. In fact the ratio of passenger fares to freight rates ranges from 0.2 to 0.8 in most developing countries (*China* and *the CIS Countries* are the only countries charging more) as compared with from 1.0 to 6.0 in the developed countries.

Table B.3 and Box 7.6 (main text) display a different aspect of the railway's role, its share in the national freight market (a similar analysis could be performed of the passenger market if data were more widely available for automobile travel). These show a wide range of freight market shares, with some countries almost totally dependent on rail for transport, others for which the rail function is almost irrelevant. As Box 7.6 shows, the rail role is strongly dependent on whether the country has developed according to socialist practice, and on the length of haul of rail traffic (a proxy for the size of the country).

7/ The 2 percent and 5 percent criteria are judgmental, not precise.

8/ This means the percentage which passenger-km is of the sum of passenger-km and freight tonne-km. It is a measure of whether the railway is passenger-oriented or freight-oriented.

9/ See Thompson, Wood and Iunes (1991). See also Thompson and Fraser (1993).

Table B.1: Statistics on railway scale and traffic characteristics

Railway	Date Year	Km of Line	No. of Locos	No. of Wagons	No. of Coaches	No. of MUs	Tonnes (000,000)	T-kms (000,000)	T-km growth rate (%) ('80-'91)	Pass. (000,000)	P-kms (000,000)	P-km growth rate (%) ('80-'91)	No. of Staff	Pkm as a % of TU	
														'80	DY
LATIN AMERICA:															
Antofagasta & Bolivia	1990	728	22	2,291	10	0	1.6	434.0	NA	0.0	0.0	NA	564	0	0
Argentina	1991	34,059	992	32,823	1,702	1,004	14.5	7,860.0	-3.57	284.8	10,641.0	-0.51	67,000	57	58
Bolivia	1991	3,701	54	2,053	98	37	1.3	682.3	-0.65	0.9	350.0	-4.81	6,396	45	34
Brazil - FEPASA	1992	4,915	488	11,809	252	142	18.2	6,522.3	-0.73	78.0	2,098.2	0.82	17,911	25	24
Brazil - RFFSA	1991	22,029	1,489	41,837	924	32	80.6	36,402.0	1.83	5.1	401.0	-31.36	49,341	22	1
Chile	1991	6,916	259	5,608	386	39	5.0	1,369.2	0.74	9.8	1,122.9	-4.01	6,684	50	45
Colombia	1990	2,532	138	3,752	158	16	1.0	418.0	-4.12	1.1	141.0	-5.27	5,297	27	25
Costa Rica	1991	412	38	997	92	5	0.7	79.9	NA	1.9	72.0	NA	2,329	57	47
Cuba	1989	4,807	384	8,838	403	76	13.0	2,048.0	NA	26.3	2,891.0	NA	32,452	45	59
Mexico	1991	20,324	1,700	44,003	1,263	26	46.4	32,698.2	0.61	14.9	4,686.0	4.88	83,290	8	13
Peru	1991	1,611	69	2,250	153	0	1.5	439.9	-1.30	2.3	319.8	-0.11	4,584	47	42
Uruguay	1992	2,991	42	1,830	28	6	1.0	215.0	-0.71	2.2	141.0	NA	3,355	63	40
AFRICA (Sub Saharan):															
Cameroun	1991	1,104	72	1,734	94	3	1.2	644.0	-0.22	2.3	471.4	5.74	4,133	30	42
Congo-CFCO	1991	510	37	1,735	101	0	1.1	547.0	NA	2.3	399.0	1.84	2,261	NA	42
Cote D'Ivoire	1991	650	41	783	69	8	0.5	274.0	-7.36	0.9	199.0	-17.73	1,832	68	42
Ethiopia	1991	781	22	590	31	NA	0.3	50.0	NA	1.1	157.0	NA	2,616	NA	76
Gabon	1991	683	62	1,165	37	2	2.1	189.0	25.81	0.1	54.2	17.00	1,715	28	22
Ghana	1990	953	39	765	203	0	0.7	129.0	NA	2.2	240.0	NA	6,081	82	65
Kenya	1990	2,065	218	6,476	591	0	3.5	1,919.0	-2.12	3.0	727.0	0.38	20,696	24	27
Malawi	1990	789	37	875	30	1	0.3	65.0	-12.63	1.7	115.5	3.70	4,456	25	64
Mali	1991	642	35	382	67	NA	0.5	271.9	8.59	0.8	178.4	3.56	2,578	50	40
Nigeria	1991	3,557	45	7,749	691	0	0.3	235.2	-20.82	3.4	1,255.2	-7.40	23,022	65	84
Senegal	1992	906	29	774	80	10	2.7	474.0	7.55	4.4	154.0	0.38	1,800	25	25
South Africa	1992	21,635	3,944	153,396	3,776	2,792	169.0	89,248.0	NA	469.9	10,419.0	-6.83	155,882	NA	10
Sudan	1991	4,784	142	6,279	400	0	0.4	646.0	-11.04	2.0	501.0	-8.21	21,753	36	44
Tanzania	1991	2,800	82	2,685	110	0	1.0	683.9	NA	2.5	769.4	NA	13,123	NA	53
TAZARA	1990	1,860	100	1,796	98	0	1.0	1,456.9	NA	1.6	547.0	7.83	6,391	22	27
Uganda	1991	1,241	52	1,460	70	0	0.4	97.8	5.01	0.4	59.8	-4.98	5,762	NA	38
Zaire	1990	4,511	154	5,200	307	35	3.8	1,732.0	0.28	1.0	260.0	-5.21	22,253	20	13
Zambia	1991	1,273	56	6,773	79	0	3.4	776.0	-2.62	0.8	176.0	-6.68	8,273	NA	18
Zimbabwe	1991	2,745	392	17,099	401	0	14.4	5,394.0	-2.14	2.4	571.4	3.86	17,158	5	10
MIDDLE EAST & N. AFR:															
Algeria	1992	4,290	206	10,042	674	13	11.1	2,522.0	0.47	58.4	2,904.0	4.37	18,046	46	54
Egypt	1992/93	8,104	540	11,112	2,975	165	10.5	3,141.0	3.06	663.0	44,293.0	11.90	88,200	84	93
Iran	1991	4,847	531	13,288	916	4	16.4	7,701.0	4.18	8.1	4,725.0	-2.31	35,866	NA	38
Jordan	1992	292	25	446	0	0	2.9	796.1	-1.13	0.0	0.0	NM	1,322	0	0
Morocco	1992	1,907	249	9,832	644	8	27.3	4,841.6	2.08	11.4	2,232.7	7.75	14,075	20	32
Syria	1992	2,408	132	4,327	495	10	4.3	1,106.0	8.18	4.3	1,253.0	12.22	10,028	40	53
Tunisia	1992	2,278	194	5,493	280	36	10.7	2,014.0	1.72	30.7	1,078.0	1.54	9,247	34	35
EUROPE & C. ASIA:															
Albania	1990	734	71	2,100	114	0	6.7	584.0	NA	11.9	779.0	NA	8,435	44	57
Bulgaria	1991	4,299	965	40,451	2,009	93	35.2	8,685.0	-5.18	72.8	4,866.4	-1.61	62,041	NA	36
Czechoslovakia	1991	13,116	4,182	134,074	6,250	1,330	189.7	45,819.0	-2.34	405.8	19,263.0	0.66	221,812	20	30
Hungary	1992	7,603	1,466	52,778	3,180	259	52.8	9,750.0	-4.16	171.5	9,010.0	-1.95	103,090	36	48
Poland	1992	23,399	6,346	140,885	7,690	1,334	196.8	56,951.0	-3.65	549.3	32,571.0	-0.16	275,100	26	36
Romania	1991	11,365	4,328	142,222	6,520	141	145.6	32,468.0	-4.42	362.6	25,429.0	2.15	197,764	23	44
Turkey	1992	8,430	783	18,847	1,086	138	15.7	8,331.0	3.64	133.3	6,259.0	0.98	46,469	54	43
Yugoslavia	1990	9,490	1,372	52,013	3,629	457	77.4	23,149.0	-2.54	108.8	11,325.0	-1.61	140,187	29	33
Slovenia	1992	1,201	228	8,480	308	114	13.0	2,574.0	-0.40	12.3	547.0	-2.20	12,691	27	18
Former Soviet Union	1991	147,500	34,166	1,657,400	58,287	19,013	3,513.9	3,362,200.0	0.57	3,523.0	384,000.0	1.66	1,863,000	9	10
Russia	1992	85,629	9,143	658,600	36,157	6,511	1,630.8	1,966,399.0	0.38	2,366.4	253,200.0	NA	1,240,600	9	11
Ukraine	1990	23,316	3,236	223,565	NA	1,809	1,008.3	488,243.0	NA	671.9	81,998.0	NA	346,748	NA	14
Kazakhstan	1990	14,148	1,700	106,580	NA	59	345.2	406,897.0	NA	41.0	19,734.0	NA	143,278	NA	5
Belarus	1990	5,507	496	29,804	NA	375	121.5	75,373.0	NA	159.8	16,852.0	NA	59,308	NA	18

EAST ASIA:

Cont'd.

Table B.1: Statistics on railway scale and traffic characteristics (cont'd.)

Railway	Data Year	Km of Line	No. of Locos	No. of Wagons	No. of Coaches	No. of MUs	Tonnes (000,000)	T-km growth		Pass. (000,000)	P-km growth		Pkm as a % of TU		
								T-kms (000,000)	rate (%) ('80-'91)		P-kms (000,000)	rate (%) ('80-'91)	No. of Staff	'80	DY
Burma (Myanmar)	1991	3,336	354	7,572	1,070	0	1.8	449.2	-3.24	53.2	3,938.7	0.63	28,811	87	90
China	1991	53,416	13,906	370,000	27,612	0	1,479.0	1,094,807.0	6.75	942.1	282,484.0	7.63	3,420,000	20	21
Indonesia	1987	6,458	518	13,398	1,208	0	7.9	1,600.0	NA	48.3	7,300.0	NA	51,601	86	82
Republic of Korea	1991	3,091	592	15,741	2,166	888	57.4	14,494.0	3.03	679.3	31,454.0	3.56	37,839	67	88
Malaysia	1991	1,672	137	4,663	290	40	4.3	1,262.0	NA	8.0	1,849.0	NA	7,347	NA	59
Mongolia	1992	1,920	77	1,736	227	0	8.5	2,762.8	0.89	2.6	636.3	6.49	14,355	8	19
Thailand	1991	3,861	286	8,787	1,158	181	7.9	3,365.0	2.35	87.0	12,820.0	2.58	25,171	76	79
Vietnam	1990	2,764	491	5,278	986	0	2.3	829.0	2.05	10.6	2,135.0	-3.25	55,000	86	72
SOUTH ASIA:															
Bangladesh	1991/92	2,746	308	15,162	1,430	7	2.5	718.4	-2.28	52.3	5,347.8	-1.80	55,413	87	88
India	1991/92	62,458	8,268	346,394	29,501	3,291	360.0	256,849.9	4.34	4,048.6	314,564.0	3.52	1,654,100	57	55
Pakistan	1991/92	8,775	752	30,369	2,425	9	6.5	5,961.6	-1.48	73.3	18,158.0	1.47	124,436	67	75
Sri Lanka	1990	1,453	191	2,851	1,135	47	1.4	164.0	-2.37	66.7	2,890.0	-4.17	19,100	95	95
OTHER COUNTRIES:															
Austria	1991	5,623	1,238	34,825	2,874	333	64.7	12,322.0	1.54	173.6	9,208.0	2.55	65,930	NA	43
Belgium	1991	3,486	1,034	29,560	1,794	893	64.7	8,169.0	0.73	145.5	6,771.0	-0.67	44,479	46	45
Denmark	1992	2,344	320	4,461	672	588	8.2	1,890.0	1.14	142.9	4,600.0	1.63	20,998	70	71
Finland	1991	5,874	685	14,700	771	100	31.1	7,634.0	-0.55	45.8	3,230.0	-0.21	19,569	28	30
France	1991	33,446	5,541	141,800	9,647	1,750	139.4	50,632.0	-2.71	828.6	62,101.0	1.31	198,627	44	55
Greece	1991	2,484	233	11,028	512	178	3.5	606.0	-1.56	12.3	1,995.0	3.30	13,005	64	77
Ireland	1991	1,944	126	1,830	239	40	3.3	603.0	-1.14	25.6	1,290.0	3.19	11,518	62	68
Israel	1991	574	52	1,400	73	0	7.7	1,092.0	3.11	2.9	186.0	-3.28	1,446	NA	15
Italy	1991	16,066	3,169	97,323	11,325	1,701	61.0	19,963.0	1.81	438.0	46,427.0	2.53	180,055	NA	70
Japan	1991	20,252	1,690	30,231	2,169	19,511	58.3	26,791.0	-2.75	8,675.9	247,031.0	2.26	193,251	84	90
Netherlands	1991	2,780	497	8,384	447	731	17.8	3,038.0	-0.44	304.8	12,796.0	2.31	26,949	72	81
Portugal	1991	3,116	325	4,439	542	276	7.0	1,880.0	5.07	223.6	5,688.0	0.20	21,547	86	77
Spain	1991	12,570	1,259	36,073	1,878	701	25.3	10,022.0	0.38	316.3	15,022.0	0.71	48,923	56	60
Sweden	1991	10,970	964	24,993	1,183	303	52.0	17,980.0	2.25	77.6	5,524.0	-1.50	26,283	30	24
United Kingdom	1991	18,584	2,562	30,888	2,722	2,809	135.8	17,274.0	0.08	739.7	32,058.0	0.90	137,788	64	65
West Germany	1991	27,079	6,042	244,287	11,636	2,224	273.3	61,991.0	0.19	1,070.4	45,639.0	0.75	231,686	39	42
Australia: ANR	1990	6,612	213	5,554	197	13	14.1	7,400.0	3.97	294.0	NA	NA	5,965	NA	NA
Australia: SRA N.S. Wales	1990	7,676	558	7,613	43	2,068	58.3	14,200.0	4.07	2.7	1,030.0	-7.38	26,602	29	7
New Zealand	1990	4,029	341	10,067	108	151	8.1	2,408.0	-2.40	11.1	NA	NA	12,560	NA	NA
Canada: Via Rail	1991	18,500	0	0	484	217	0.0	0.0	NM	3.6	1,322.9	-8.51	4,477	100	100
Canada: Canadian National	1990	32,327	1,465	65,112	81	0	103.4	127,838.2	NA	0.0	0.0	NM	34,413	0	0
Canada: Canadian Pacific	1991	22,444	1,221	41,222	0	0	85.2	101,806.0	1.03	0.0	0.0	NM	21,988	0	0
USA: Amtrak	1990	39,540	318	0	1,955	28	0.0	0.0	NM	22.2	9,769.4	3.14	24,000	100	100
USA: Commuter Railways	1989	7,890	436	0	2,090	1,925	0.0	0.0	NM	319.2	11,134.8	NM	25,000	100	100
USA: Burlington Northern	1992	36,752	2,249	58,927	0	0	278.2	343,784.8	4.29	0.0	0.0	NM	31,204	0	0
USA: Conrail	1992	19,185	1,982	61,613	0	0	184.3	124,987.1	1.06	0.0	0.0	NM	24,551	0	0
USA: Denver & Rio Grande	1992	3,824	283	10,179	0	0	29.6	23,667.5	1.95	0.0	0.0	NM	2,384	0	0
USA: Florida East Coast	1991	713	77	3,172	0	0	14.6	5,656.9	4.98	0.0	0.0	NM	981	0	0
USA: All Class I Railways	1992	182,348	18,004	552,787	0	0	1,834.5	1,576,007.5	1.68	0.0	0.0	NM	197,421	0	0

¹ Data from one year prior to data year stated in first column, Table 1.

² Data from two years prior to data year stated in first column, Table 1.

³ Data from three years prior to data year stated in first column, Table 1.

⁴ Data from four years prior to data year stated in first column, Table 1.

⁵ Data from five years prior to data year stated in first column, Table 1.

Source: World Bank Railway Database.

Table B.2: Statistics on railway performance

Railway	Date Year	Avg Length of Pass Trip (km)	Avg Length of Frt Haul (km)	TU per Line Km (000)	TU per Loco + MU's (000,000)	Tkm per Wagon (000)	Pkm per Coach+MU (000)	TU per Staff (000)	Staff Costs as % of Revenue	Diesel Loco Availability, %		Ratio: Pass. Fares to Frt Rates	Operating Ratio a/ w/ norm.	
										'80	DY		%	w/o norm.
LATIN AMERICA:														
Antofagasta & Bolivia	1990	NM	271.3	596.2	19.7	189.4	0.0	769.5	NA	NA	68 1	NM	NA	NA
Argentina	1991	37.4	543.2	543.2	18.6	239.5	3,932.4	276.1	168 5	75	49 1	NA	NA	NA
Bolivia	1991	388.4	520.8	278.9	17.6	332.3	2,592.6	161.4	29	61	62	37.6	83	95 4
Brazil - FEPASA	1992	26.9	358.4	1,753.9	17.0	552.3	5,325.4	481.3	108	80	62	59.9	119	163
Brazil - RFFSA	1991	79.2	451.7	1,670.7	24.7	870.1	419.5	745.9	51 4	89	84 4	69.5	83 4	98 4
Chile	1991	114.3	273.9	360.3	9.4	244.2	2,642.1	372.8	46 4	52	57 4	53.4 4	NA	185 4
Colombia	1990	128.2	418.0	220.8	4.0	111.4	819.8	105.5	160 3	32	35 3	52.8 3	181 3	244 4
Costa Rica	1991	37.5	114.8	368.7	3.9	80.1	742.3	65.2	33 3	NA	46	12.7 4	131	288
Cuba	1989	109.9	157.5	1,027.5	12.6	231.7	6,035.5	152.2	62 3	56	60 3	NA	NA	NA
Mexico	1991	314.5	704.6	1,839.4	21.9	743.1	3,835.4	448.8	48 5	77	64 5	48.6 3	NA	NA
Peru	1991	140.9	292.1	471.6	11.0	195.5	2,090.2	165.7	66	NA	41 1	48.0	132	131 2
Uruguay	1992	62.9	215.0	119.0	8.3	117.5	4,147.1	106.1	219 1	49	62	42.7 5	304 3	257 1
AFRICA (Sub Saharan):														
Cameroun	1991	202.4	523.6	1,010.3	15.4	371.4	4,859.8	269.9	56	71	72	43.8	119	130
Congo-CFCO	1991	174.9	495.0	1,854.9	25.6	315.3	3,950.5	418.4	29 4	NA	56 4	43.1 4	NA	NA
Cote D'Ivoire	1991	214.7	556.9	727.7	11.3	349.9	2,584.4	258.2	58 4	82	44	55.5 4	127 5	141 5
Ethiopia	1991	143.4	167.2	265.0	9.4	84.7	5,064.5	79.1	58 2	NA	60 2	31.4 2	NA	NA
Gabon	1991	379.0	88.0	356.1	3.9	162.2	1,389.7	141.8	68	NA	94 3	67.5 2	307	368
Ghana	1990	109.1	184.3	387.2	9.5	168.6	1,182.3	60.7	142 4	NA	57 4	18.1 4	NA	201 4
Kenya	1990	243.2	554.5	1,281.4	12.1	296.3	1,230.1	127.9	46 1	64	52	34.4	NA	91 2
Malawi	1990	67.4	194.0	228.8	4.9	74.3	3,725.8	40.5	58	NA	77	21.7	87	87
Mali	1991	220.8	543.8	701.4	12.9	711.8	2,662.7	174.7	31	NA	48	73.1	107	98 3
Nigeria	1991	369.2	784.0	419.0	33.1	30.4	1,818.5	64.7	NA	63	20 1	13.1 1	NA	315 4
Senegal	1992	35.0	175.6	693.2	20.8	612.4	1,711.1	348.9	43 2	55	62 2	51.3 4	89 5	91 5
South Africa	1992	22.2	528.1	4,606.7	23.2	581.8	1,588.3	639.4	87 1	NA	82 1	69.5 2	NA	NA
Sudan	1991	248.0	1,523.6	239.8	8.1	102.9	1,252.5	52.7	104	NA	29	39.2	102	145
Tanzania	1991	307.8	683.9	559.0	17.7	254.7	6,994.5	110.7	NA	70	65 2	NA	NA	NA
TAZARA	1990	341.9	1,456.9	1,077.4	20.0	811.2	5,581.6	313.6	41 4	41	49 3	28.5 3	NA	NA
Uganda	1991	158.6	235.1	127.0	3.0	67.0	854.3	27.4	24	NA	50	10.1	NA	132
Zaire	1990	280.0	455.8	441.6	12.6	333.1	780.2	89.5	37 5	53	41 2	34.5 5	164 4	164 4
Zambia	1991	223.4	225.9	747.8	17.0	114.6	2,227.8	115.1	18	67	44	12.4	85	NA
Zimbabwe	1991	240.6	375.2	2,173.2	15.2	315.5	1,424.9	347.7	104 1	61	54 3	61.0 1	82	82
MIDDLE EAST & N. AFR.:														
Algeria	1992	49.7	227.2	1,264.8	26.1	251.1	4,227.1	300.7	110	85	90	54.0	118	145
Egypt	1992/93	66.8	299.1	5,853.2	84.6	282.7	14,106.1	537.8	50	80	93	19.6	143	157
Iran	1991	580.8	470.4	2,563.6	23.4	579.6	5,135.9	346.5	NA	NA	39	NA	NA	NA
Jordan	1992	NM	279.3	2,726.2	31.8	1,784.9	NM	602.2	29	NA	65	NM	83 2	83 2
Morocco	1992	196.0	177.3	3,709.6	28.3	492.4	3,424.4	502.6	50	69	82	81.0	123	123
Syria	1992	291.4	257.2	979.7	17.7	255.6	2,481.2	235.2	54	90	60	21.5	58	59
Tunisia	1992	35.2	188.2	1,357.3	15.6	366.6	3,411.4	334.4	72	88	59	81.8	128	130
EUROPE & C. ASIA:														
Albania	1990	65.4	87.8	1,856.9	19.2	278.1	6,833.3	161.6	NA	78	78	NA	NA	NA
Bulgaria	1991	66.9	246.5	3,152.2	13.9	214.7	2,315.1	218.4	NA	NA	90 1	39.9	104	104
Czechoslovakia	1991	47.5	241.5	4,982.0	15.0	341.7	2,541.3	293.4	36	90	87	20.6	104	104
Hungary	1992	52.5	184.7	2,467.4	12.5	184.7	2,819.9	182.0	60	79	82 1	30.7	100	109
Poland	1992	59.3	289.4	3,825.9	13.7	404.2	3,609.4	325.4	43 1	NA	72 1	24.9 1	111 1	121 1
Romania	1991	70.1	222.9	5,094.3	13.3	228.3	3,817.6	292.8	62	85	52	28.3	96	100
Turkey	1992	47.0	530.6	1,730.7	18.7	419.8	5,113.6	314.0	189	61	78	47.0	126 1	175 1
Yugoslavia	1990	104.1	299.1	3,632.7	24.1	445.1	2,771.7	245.9	NA	79	74 3	38.5 1	NA	NA
Slovenia	1992	44.5	198.0	2,598.7	12.9	303.5	1,298.2	245.9	46	NA	81	73.9	142	190
Former Soviet Union	1991	109.0	956.8	25,398.0	102.5	2,028.6	5,099.6	2,010.8	34 5	82	82	134.0	NA	NA
Russia	1992	107.0	1,205.9	25,821.1	222.9	2,985.7	5,934.2	1,789.1	NA	NA	NA	NA	97	97
Ukraine	1990	122.0	484.2	24,457.1	164.7	2,183.9	NA	1,844.5	NA	NA	NA	NA	74	74
Kazakhstan	1990	481.8	1,178.8	30,154.9	249.9	3,817.8	NA	2,977.8	NA	NA	NA	NA	70	70
Belarus	1990	105.6	620.2	16,746.9	169.9	2,529.0	NA	1,555.0	NA	NA	NA	NA	72	72

Cont'd.

Table B.2: Statistics on railway performance (cont' d.)

Railway	Data Year	Avg Length of Pass Trip (km)	Avg Length of Frt Haul (km)	TU per Line Km (000)	TU per Loco + MU ^a (000,000)	Tkm per Wagon (000)	Pkm per Coach+MU (000)	TU per Staff (000)	Staff Costs as % of Revenue	Diesel Loco Availability, %		Ratio: Pass. Fares to Frt Rates	Operating Ratio ^a	
										'80	DY		w/ norm. %	w/o norm. %
EAST ASIA:														
Burma (Myanmar)	1991	74.1	256.7	1,315.3	12.4	59.3	3,681.0	152.3	NA	60	75	41.7	NA	77
China	1991	299.9	740.2	25,784.2	99.0	2,958.9	10,230.5	402.7	12	82	82	151.6	70	NA
Indonesia	1987	151.1	202.5	1,378.1	17.2	119.4	6,043.0	172.5	58	NA	75	43.0	NA	121
Republic of Korea	1991	46.3	252.4	14,865.1	65.4	920.8	10,299.3	1,214.3	52	90	88	87.4	93	95
Malaysia	1991	231.1	293.5	1,860.6	21.9	270.6	5,603.0	423.4	59	NA	78	76.3	NA	143
Mongolia	1992	247.5	324.3	1,770.4	44.1	1,591.5	2,803.1	236.8	16	NA	58	269.5	87	87
Thailand	1991	147.4	425.9	4,191.9	52.4	383.0	9,574.3	643.0	63	75	72	63.8	NA	110
Vietnam	1990	202.4	360.4	1,072.4	6.0	157.1	2,165.3	53.9	NA	NA	60	28.9	111	NA
SOUTH ASIA:														
Bangladesh	1991/92	102.3	286.7	2,209.1	19.6	47.4	3,721.5	109.5	89	71	74	13.3	131	131
India	1991/92	77.7	713.4	9,148.8	65.8	741.5	9,592.7	345.5	42	86	90	32.4	90	90
Pakistan	1991/92	247.7	917.2	2,748.7	32.0	196.3	7,460.1	193.8	37	85	78	33.8	95	95
Sri Lanka	1990	43.3	117.1	2,101.9	15.5	57.5	2,445.0	159.9	96	70	70	11.5	318	318
OTHER COUNTRIES:														
Austria	1991	53.0	190.5	3,828.9	16.8	353.8	2,871.2	326.6	116	NA	89	94.5	98	136
Belgium	1991	46.5	126.3	4,310.4	13.3	276.4	2,722.6	335.9	153	96	83	272.0	101	161
Denmark	1992	32.2	229.2	2,768.8	16.5	423.7	3,650.8	309.1	84	NA	NA	99.0	84	141
Finland	1991	70.5	245.7	1,849.5	15.6	519.3	3,708.4	555.2	72	89	99	168.1	98	107
France	1991	74.9	363.2	3,370.6	19.6	357.1	5,448.9	587.6	88	93	92	141.2	96	113
Greece	1991	162.8	171.2	1,047.1	10.2	55.0	2,891.3	200.0	135	55	54	34.3	207	307
Ireland	1991	50.3	182.2	973.8	14.5	329.5	4,623.7	164.4	133	74	69	269.5	100	134
Israel	1991	64.1	141.8	2,226.5	24.6	780.0	2,547.9	883.8	NA	NA	82	112.4	128	128
Italy	1991	106.0	327.2	4,132.3	19.6	205.1	3,564.2	368.7	165	NA	78	128.7	100	266
Japan	1991	28.5	459.5	13,520.7	66.3	886.2	11,394.4	1,416.9	29	81	85	191.6	84	85
Netherlands	1991	42.0	171.1	5,695.7	26.9	475.9	10,862.5	587.8	98	93	84	134.1	92	153
Portugal	1991	25.4	236.1	2,358.2	20.4	374.0	6,953.5	341.0	150	84	87	77.0	157	220
Spain	1991	47.5	395.9	1,992.4	18.6	277.8	5,824.7	511.9	110	83	82	149.1	115	131
Sweden	1991	71.2	345.6	2,142.6	23.5	719.4	3,717.4	894.3	75	83	88	385.5	96	98
United Kingdom	1991	43.3	127.2	2,974.7	17.1	559.2	8,013.5	358.0	79	75	74	160.2	102	126
West Germany	1991	42.6	226.8	3,974.7	17.0	253.8	3,292.9	464.8	136	94	89	164.2	121	176
Australia: ANR	1990	NA	524.8	NA	NA	1,332.4	NA	NA	48	NA	81	NA	NA	NA
Australia: SRA N.S. Wales	1990	381.5	243.7	1,984.1	18.7	1,865.2	487.9	572.5	120	85	85	217.0	116	163
New Zealand	1990	NA	297.3	NA	NA	239.2	NA	NA	54	90	90	NA	NA	NA
Canada: Via Rail	1991	364.1	NM	71.5	48.8	NM	1,887.2	295.5	43	NA	NM	336.3	110	363
Canada: Canadian National	1990	NM	1,236.7	3,954.5	87.3	1,963.4	0.0	3,714.8	44	NA	NA	NM	98	NA
Canada: Canadian Pacific	1991	NM	1,195.5	4,536.0	83.4	2,469.7	NM	4,630.1	30	NA	97	NM	NA	90
USA: Amtrak	1990	440.1	NM	247.1	30.4	NM	4,926.6	407.1	NA	NA	83	642.1	NA	154
USA: Commuter Railways	1989	34.9	NM	1,448.0	16.5	NM	2,773.3	445.4	NA	NA	NA	NM	NA	NA
USA: Burlington Northern	1992	NM	1,244.8	9,354.2	152.9	5,834.1	NM	11,017.3	26	NA	NA	NM	87	87
USA: Conrail	1992	NM	678.1	6,514.8	83.1	2,028.6	NM	5,090.9	28	NA	NA	NM	84	84
USA: Denver & Rio Grande	1992	NM	798.6	6,530.8	83.6	2,325.1	NM	9,927.6	28	NA	NA	NM	97	97
USA: Florida East Coast	1991	NM	387.0	7,934.0	73.5	1,783.4	NM	5,766.5	24	NA	NA	NM	91	91
USA: All Class I Railways	1992	NM	859.1	8,642.9	87.5	2,851.0	NM	7,983.0	27	NA	90	NM	89	89

1 Data from one year prior to data year stated in first column, Table 1.

2 Data from two years prior to data year stated in first column, Table 1.

3 Data from three years prior to data year stated in first column, Table 1.

4 Data from four years prior to data year stated in first column, Table 1.

5 Data from five years prior to data year stated in first column, Table 1.

a (operating expenses/revenue), with normalization includes government subsidies in the revenue figure.

NM - not meaningful

NA - not available

Source: World Bank Railway Database.

Table B.3
Rail traffic share and length of haul

RAILWAY:	Avg. Freight Haul Length (Km) 1987	Rail T-Km As % of Rail + Truck T-Km 1987
LATIN AMERICA:		
Argentina	571	10
Brazil	453	29
Chile	263	29
Colombia	578	8
Mexico	605	23
Uruguay	224	13
AFRICA (Sub Sahara):		
Cameroun	478	na
Ghana	170	na
Kenya	552	35
Madagascar	348	32
Nigeria	707	na
Senegal	144	na
Sudan	910	65
Tanzania	694	na
Zaire	435	na
Zambia	233	na
Zimbabwe	427	na
Middle East & North Africa:		
Algeria	235	4
Morocco	187	30
Tunisia	198	16
Egypt	343	18
Europe & Central Asia:		
Czechoslovakia	234	85
Hungary	186	62
Poland	286	74
Romania	265	94
Yugoslavia	306	55
Turkey	522	10
Pakistan	823	20
Former Soviet Union	960	89
ASIA:		
Bangladesh	254	23
China	691	76
India	725	53
Indonesia	203	na
Republic of Korea	225	38
Malaysia	360	8
Mongolia	321	74
Sri Lanka	130	20
Thailand	488	11
OTHER COUNTRIES:		
Austria	203	na
Belgium	95	30
Finland	250	25
France	354	27
Greece	151	4
Japan	362	9
Netherlands	161	4
Portugal	228	8
Spain	317	10
Sweden	332	42
United Kingdom	121	12
West Germany	212	28
Canada	1,100	68
USA:All Class I Railways	1,121	58

Source: World Bank Railway Database, Country Yearbooks and World Bank reports.

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