EVALUATING PROJECT PERFORMANCE OF TRANSPORT PROJECTS IN DEVELOPING COUNTRIES

Peter N Freeman
Operations Evaluation Department, World Bank, Washington DC.
pfreeman@worldbank.org

Abstract

Every year large numbers of new transport projects are initiated in developing countries with varying degrees of success. But what do we mean by success? Evaluation techniques have been developed to try to objectively measure the performance not only of projects, but also the way they are managed. This is important to understand which investments have been effective and under what circumstances. Over the past 30 years the World Bank has been involved in ex post evaluation and has developed an approach that yields considerable information about performance. Over time some interesting trends have emerged and lessons can definitely be drawn from the cumulative evaluations. This paper concentrates on the transport sector and summarizes the main findings for World Bank supported projects that have been documented to date. It also discusses and analyses recent trends including the rise and then decline in private sector financing of transport projects. Finally, it identifies some gaps and needs for future research.

Keywords: Evaluation; Financing; Performance; Efficiency; Sustainability
Topic area: G02 - Rural, national and international transport

1. Introduction

The World Bank, in keeping with most other development agencies, regards evaluation as an important tool to enhance development effectiveness. Evaluations may be categorized in various ways, but the most common variants are project, process, country, thematic and sector evaluations. This paper focuses on projects in the transport sector, discusses approaches to the successful evaluation of such projects, elaborates on some lessons learnt by the Bank and identifies knowledge gaps and future evaluation opportunities in the sector. Particular attention is given to trends in private sector financing which has peaked and is now in decline. Some opportunities for future research are also examined and some specific and generic lessons are recorded.

Transportation is crucial to building a climate of investment and to investing in poor people, thus empowering them to participate in development. Through rural roads, people have access to markets, schools and health facilities, while main highways, railways, ports and airports effectively underpin developing countries' economies. Value addition by transport is estimated to account for between three and five per cent of Gross Domestic Product (GDP) worldwide. Public investment in transport typically accounts for about two and a half per cent of GDP, but may rise as high as three and a half per cent in countries modernizing outdated infrastructure. For these reasons transportation has been and continues to be a key sector for World Bank investment. (See Figure 1).

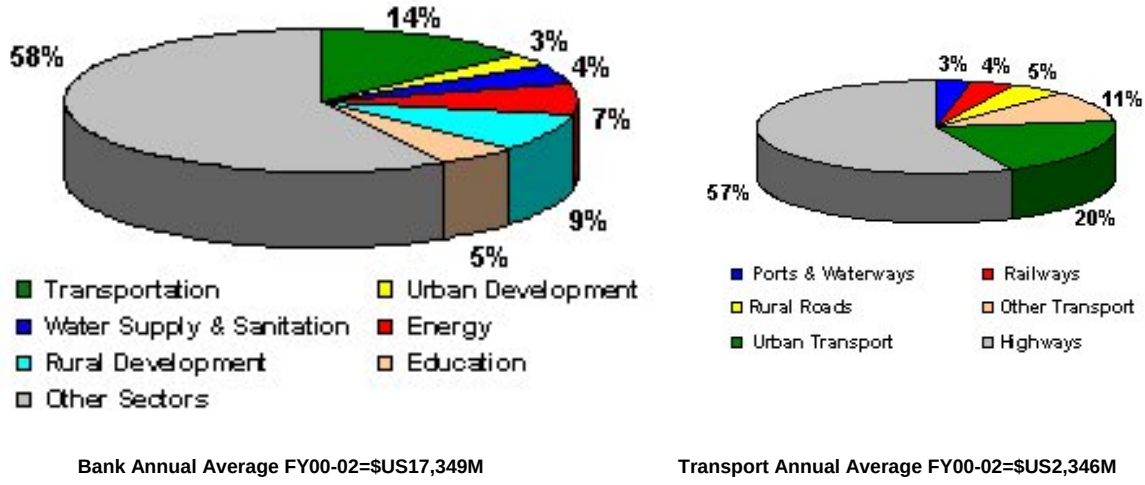

Figure 1 World Bank Lending for Transport

2. Scope of transport sector and bank involvement

One of the features of the transport sector is the variety of distinctive transport modes. Projects in each mode have different characteristics and performance measurements need to take this into account. In every case the project objectives and the performance indicators agreed with the Borrower during project design are crucial for assessing the performance of a project.

Highways comprise a very significant proportion of this lending. Most roads are financed by the public sector with work executed through competitively-bid contracts. Increasingly however, construction and maintenance are becoming the responsibility of specialist Road Agencies rather than government departments, while there is also a trend towards independent Road Boards. There is in some circumstances scope for Public-Private-Partnership (PPP) projects for major highways, bridges and tunnels. At the other end of the scale in rural areas, accessibility and employment creation are significant factors and there are many examples of rural roads constructed using labor-intensive techniques.

Road haulage, on the other hand, is considered best provided by the private sector in competitive markets; where such an industry is poorly developed, there may be a case for enterprise development assistance to freight operators and to help build freight forwarding capacity. The most successful model for road passenger services has been found to be either the creation of competitive or periodically contestable operations by private companies, with specific reimbursements or public service contracts to meet public service obligations.

Marine and inland waterway transport comprises mainly port and navigation infrastructure. For the larger ports the “landlord” model is usually preferred in which the role of the public sector is as a corporative and commercially run port landlord. Although sea and river transport services are best provided by the private sector there may be specific

circumstances, such as road ferries that are essentially part of an otherwise public road network, when loan funding of publicly-owned vessel services could be considered. The public sector also provides air navigation services in nearly all countries. Most major airports are publicly owned, but private participation is increasing. The private sector is preferred as the supplier of airport and airline services.

Railway infrastructure too has been increasingly provided by the private sector. There have always been many big stand-alone private mineral and other resource based rail operations internationally, but recent private participation in previous public rail infrastructure has also been through concessions or privatization of vertically integrated predominantly freight railways. By contrast, most predominantly passenger railways remain publicly-owned with budgetary support for both train operations and infrastructure investment. In general in these cases support can be given where such railways fulfill an important social and/or economic role which cannot easily be replaced by other means. Such support will usually be in the context of sector reforms involving corporatization and business restructuring, with targeted and sustainable revenue support mechanisms.

In the urban environment, mega-cities with populations of over 10 million inhabitants are rapidly emerging and the majority of these metropolises are now located in developing countries. Since transportation policies play a critical role in shaping these cities this poses a whole new set of transport financing challenges and raises questions about user charging, the role of public and private transport and the need for creative thinking in this arena. Given the Bank's role in assisting to extend the frontier in this field through project innovation, the evaluator's responsibility is to assess the performance of such assistance.

Lastly, informal transport services are receiving attention. These include non-motorized means such as pedestrians, bicycles and animal-drawn wagons as well as motorized transport including motorcycles and minibus taxis. A rich variety of small-scale transport operators exists in many developing countries, frequently providing major sources of low-income employment. In some cases there may be a need for micro-finance initiatives. Their existence alongside formal services creates competition in the market and puts competitive pressure on the formal operators.

3. Approach to evaluation of transport projects

The Operations Evaluation Department (OED) is an independent unit within the World Bank and reports directly to the Bank's Board of Executive Directors. OED assesses what has worked and what has not, including how borrowers operate and maintain projects and the quality of the contribution of the Bank itself to a country's development. The goals of evaluation are to learn from experience, to provide an objective basis for assessing the results of the Bank's work, and to provide accountability in the achievement of its objectives. It also helps to improve Bank performance by identifying and disseminating the lessons learned from experience and by framing recommendations drawn from evaluation findings.

Bank operational staff first prepare a self-evaluation report (known as an Implementation Completion Report, or ICR) for every completed project, and also rate project performance. OED staff review every ICR, validate the self-rating, and identify projects that offer good potential for further learning as candidates for a project performance assessments.

One in four completed projects (or about 70 a year) is subject to a Project Performance Assessment Report (PPAR), which takes about six staff weeks to produce and normally includes a field mission. In a PPAR, projects are rated in terms of their outcome taking into

account relevance, efficacy (i.e. the extent to which a project's objectives are achieved) and efficiency. Sustainability of results, and institutional development impact are also rated, as well as performance of both the Bank and the Borrower. Such assessments are carried out after Bank funds have been fully disbursed to a project and are the main project-level evaluations conducted by OED.

For each project to be evaluated a comprehensive project assessment form is completed by the evaluator, who also has a guideline indicating what is expected in terms of performance to achieve particular ratings in each category. This is to ensure that a consistent approach is followed and also that no aspect is neglected. Special attention is paid to areas where the Bank has instituted a "safeguard" policy for sensitive matters such as involuntary resettlement, dam safety, disputed areas, environmental assessment and several other potentially contentious issues. Once the evaluator has completed his or her assessment it is referred to a panel of reviewers to ensure there is concurrence with the ratings given and to ensure quality control. The regional operations staff are also given the opportunity to comment or add information, but do not have the right to overrule the OED decision. In the case of the more detailed PPARs, the country concerned is asked to comment and any contribution they may make is published verbatim in the final version of the document.

For reasons of both economy and synergy it is not uncommon for a number of related projects to be assessed in a single mission. In the case of China, for example, a cross-sector review was undertaken which enabled the task team to better assess the linkages between sectors (i.e. transport with agriculture, education and health) and the combined impact of the program on poverty alleviation. This was a valuable input to the OED Country Assistance Evaluation for China. Thematic evaluations are also produced periodically. In the case of the transport sector there has not been a specific evaluation of the whole sector because of the very different characteristics of the various transport modes. However, there have been initiatives over the years to compile lessons learnt in a number of areas including ports, railways and urban transport.

4. Some lessons learnt from bank-financed transport projects

Rail

A decade ago, OED recorded its main experiences (based on evaluations of 40 projects) in funding railway projects (Clare de Weille, 1993). These projects were typically designed to augment carrying capacity through rehabilitation and modernization, to improve operating efficiency and service levels and to strengthen the railway's financial position. In most cases the Bank financed a time slice of a multiyear investment program.

The main conclusions were that project implementation often fell short of expectations; only 52 percent were rated as satisfactory. The principal reasons for this disappointing performance were:

- Management's lack of sufficient authority over rates and other key matters;
- Lack of commercial approach to the transport market;
- Resistance to change in railway management, labor unions and government institutions;
- Inefficient operations;
- Reluctance by the Bank to penalize failure to comply with loan covenants; and
- Excessive reliance on loan covenants to achieve goals.

The review continued by commenting that there was also a distinct lack of realism in forecasting traffic and financial performance. Experience suggests that traffic forecasters should carefully assess whether railway managers are able to compete effectively with often aggressive competition from road operators.

Several of the railways assisted by Bank loans continued to run inefficiently even after project implementation. Targets for operating indicators such as locomotive availability and wagon turnaround time were not often achieved and operating performance was disappointing; mainline locomotive availability ranged from 61 percent to 89 percent and wagon turnaround time from 3.4 days to 23.8 days. Elaborate action programs to improve operational performance were often only partially implemented.

Many railways were overstaffed, leading to inefficiency, high costs and financial weakness. Commitments to downsize were often not carried through because of powerful institutional forces. Similarly many uneconomic lines and services were kept in operation because of strong political pressure. Financial losses were sometimes offset with special subsidies. Indeed, one of the major causes of poor project performance has been that railway management usually lacks the freedom to manage effectively because governments cling to their authority over basic decisions on pricing, key management personnel, investments, reduction of staff and so on. Other factors were that railways lacked commercial orientation and financial forecasts prepared by Bank staff working closely with railway management, nearly always proved too optimistic.

The recommendations derived from this analysis were:

- That much more attention needs to be given to the realism of traffic and financial projections in the light of experience on previous projects;
- That a condition for future projects should relate to the railway having authority over tariffs as a condition for approval;
- The Bank was also advised to take a tougher stance on the upholding of loan covenants and in cases of noncompliance should take definite steps such as the suspension of loan disbursements or even cancellation of the loan.

An analysis of Bank supported rail projects since this review shows that far fewer are being supported than was the case ten years ago. In the last three years, of nine projects reviewed, five (in China, India, Côte d'Ivoire, Mongolia and Brazil) were evaluated as satisfactory, three as moderately satisfactory (not all objectives fully achieved) and one as unsatisfactory. The one that failed (in Africa) was due to lack of commitment by the government concerned to follow through on the difficult issues such as retrenchment. In general, the rigor of the analysis was more thorough than in the past and projections more realistic, but the sample size is small. However, there does appear to be an improvement in performance. When a few more projects have been completed it will be possible to re-visit this sub-sector and evaluate more thoroughly.

Ports and Waterways

Lessons learnt from port projects were last formally summarized in 1996, when 57 port projects completed between 1980 and 1992 were identified in the database and 35 of these projects analyzed in detail (Grosdidier de Matons, 1996). Most of the projects were to develop and rehabilitate general cargo and container ports. A very few concerned inland water transport. The Bank supported engineering or planning and economic studies, technical assistance for operations, accounting, finance and project supervision. Ten supported the establishment of management information systems. Of the 35 projects reviewed, 27 had

substantially achieved their main objectives at the time the Bank completed its loan disbursements. Most of the ports had performed adequately and none had suffered congestion. But while projects achieved their physical and operational goals relatively easily, only five had a substantial impact on institutional development, and benefits were considered likely to be sustained in only 19 projects.

The average economic rate of return (ERR) of the 35 projects was re-estimated at 17% at project completion as opposed to 35% when the projects were originally appraised. Almost all projects took longer to implement than expected; the most common reason being overoptimistic civil works schedules as well as delays in procurement and in the appointment of consultants for studies. In the most successful projects such as those in Dakar, Senegal and Pusan, South Korea, the proportion of staff time invested in early preparation was well above average and experience suggests this leads to savings in supervisory costs during implementation. Overall, the main reasons for achievement were the borrower's commitment to success, the quality of preparation and appraisal and the quality of the Bank's supervision, including flexibility in adjusting project components and objectives to changing circumstances. The main causes of difficulty in implementation were lack of autonomy of port authorities, civil works problems due especially to poor soil conditions not identified earlier and procurement issues during supervision. The causes of project failure were inadequate traffic, borrower's lack of commitment and poor implementation performance. This analysis led to the conclusions that success depended on:

- Good preliminary engineering, including adequate test borings;
- Good analysis at appraisal, especially of projected cargo upon which the ERR is based;
- Thorough knowledge of the different aspects of port operations; a balanced inter-disciplinary team is important in both appraisal and implementation; and
- Basic institutional choices about the institutional model to be followed need to be made up front.

Very few port projects have been financed by the Bank since 2001, but a project in Mauritius was rated as highly satisfactory and ones in Tanzania and Benin as satisfactory. What is clear, however, is that the emphasis in future port projects is likely to focus on the logistics chain where total journey time, for example, becomes an issue. Such projects stress the integrated nature of transport and encompass, for example, port access, customs documentation and procedures as well as security issues. The private sector is also playing an increasingly important role in port investment and the International Finance Corporation (IFC) has supported the acquisition of ships, barges and certain aspects of port infrastructure.

Roads and Highways

The Bank has not formally undertaken a complete evaluation of the road sector. However, there are many individual highway evaluations and there have been specific Bank studies of, for example, toll roads, the impact of rural roads on poverty alleviation and accessibility for the poor as well as certain aspects of the financing and administration of road construction and maintenance such the road agencies and road funds (Heggie, 1995). In general terms the Bank supports the concept of road agencies and sometimes endorses road funds to redress long-term under-funding of maintenance. The Bank also encourages PPPs.

Since 2001 the number of roads and highways projects evaluated is 75 and of these 64 or 83% are rated satisfactory. Performance is generally better than in the rail and port sectors, but the majority of road projects are less complex and smaller.

The shortcomings taken from the ICR reviews have a few recurrent themes; these are:

- Under or overestimating anticipated traffic;
- Underestimating construction costs;
- Making insufficient provision for maintenance funding;
- Axle load limits not enforced;
- Inadequate attention to road safety aspects;
- Lack of systematic data collection/management systems;
- Shortcomings in respect of road safety;
- Unsatisfactory engineering design; and
- Lack of government commitment towards funding or privatizing the local road contracting industry.

There were also some cases where technical assistance objectives were neglected or commenced late because the Borrower's main focus was on the construction component and instances where technical assistance funds were wholly or partially diverted to construction when project funds were constrained due to unforeseen increases in construction cost. Fortunately, these were relatively few.

Urban Transport

Urban transport projects have received rather more attention. They were reviewed specifically in 1997 in a "Lessons and Practices" brief (Talvitie, Reja, 1997)and more recently as part of an update on the performance of the Bank's urban portfolio (Gilbert, 2003). The 1997 review recorded that the World Bank has provided more than $3 billion in loans and credits to support urban transport projects in client countries and that 87% of these projects reached their physical targets. The impact on institutional development was substantial in only 30% of cases, while sustainability of benefits was rated likely in 66% of the cases that were rated. The success of traffic management measures depended largely on strong rule of law and organizational capacity to implement the measures. Policy objectives were rarely met and actual financial performance fell far below expectations. Cost recovery was rarely achieved and policy measures to bring competition to the sector often failed.

Thirty Bank interventions in urban transport had been evaluated in the previous 20 years; 18 as stand-alone transport projects and 12 as significant components of integrated urban development projects. Of the 30 projects, 87% had satisfactory outcomes. The re-estimated average ERR was 30%, compared with 43% at appraisal.

Factors which impacted project performance included:

- Sustainability could be jeopardized by insufficient maintenance funds, inadequate cost recovery and weak local technical capacity;
- The benefits of traffic management measures sometimes quickly dissipated because traffic volumes increased faster than projected; and
- The transaction costs and government institutional capacity requirements for competitive contracting of public transport were often high and suitably qualified bidders were sometimes scarce.

Providing an adequate and efficient urban transport system not only requires investment in improving the road infrastructure and the vehicle stock, but also policy formulation that gives full consideration to the absorptive capacity and the rule of law of the specific country. Commitment to an improvement program begins with ownership and intellectual understanding of the change process.

Since the 1997 study, the Bank has formulated a new urban strategy with its primary focus upon improving livability (decent quality of life for all, including the poor), through good governance, bankability and competitiveness. Analysis of the portfolio of urban projects showed that 68% had objectives focused upon improving the living conditions of the urban poor.

Other Transport

Air transport projects account for less than one percent of the Bank transport portfolio. However, the Bank has been involved in policy advice concerning regulatory reforms, capacity building, airline restructuring and assistance with privatization. It has also on occasion, when there is a clear development case and where there is a move to a more commercial model, made loans available for airport infrastructure. The IFC is also actively involved in financing aircraft acquisition.

The Bank Group has also helped to support informal transport services through either micro-finance activities or technical assistance aimed at integrating informal operators into the formal sector.

IFC has supported pipeline projects such as the natural gas line from Mozambique to South Africa.

5. Private sector financing in transport

The International Bank for Reconstruction and Development (IBRD) and International Development Association (IDA) lending for transport sector projects has been declining and in Fiscal Year 2002 averaged just over 12 per cent or US$2,390 billion of the total World Bank lending portfolio. This figure confirmed a downward trend which began in 1998. Prior to this time, between 1993 and 1997, the annual average transport-related lending averaged 16 per cent annually. A similar pattern can also be observed for the entire infrastructure sector.

Transportation is a key component of infrastructure provision and in this regard is an important element of the Bank's infrastructure business. An *Infrastructure Action Plan* was developed to re-vitalize this business following signals that there has been a slowing in infrastructure service delivery, perceived as vital for economic growth and poverty reduction. Of particular concern was the recent dramatic decline in private investment in infrastructure in developing countries.

During the 1990's, according to the World Bank Private Sector Database, the private sector committed US$84.6 billion for transport investment, which was three times as much as the Bank's lending for transport during the same period. This was a boom period for private sector investment and can be attributed to several factors including the demise of a number of communist regimes in Eastern Europe and the former Soviet Union, macroeconomic and fiscal crises in several developing nations and ideological shifts in government thinking, especially in Latin America. In addition, the trend toward private sector development (PSD) in the transport sector has been bolstered by intellectual arguments and theories of competition that question the natural monopoly structure of various industries. These include the theory of contestable markets (Baumol et al., 1982), which was influential in airline deregulation in the USA, the concept of open access that has been key to telecommunications (Spiller, Cardilli, 1997) and other utility deregulation and, more specifically in transportation, the realization that various modes can compete with each other in such a way that scale

economies and other market failures within modes need not necessarily preclude competitive markets as was previously contended.

The enthusiasm that went with the expansion of the role of the private sector in transport activities in the 1990s, however, was dampened when it was appreciated that the task was much more complex than had been imagined. This was in part due to imperfect market conditions, but especially to institutional constraints and the weak rule of law in many developing countries. As private sector investors began to assess the potential risks more rigorously, international capital flows peaked and started to decline. Although this could in part be attributed to the Asian financial crisis, it also reflected a longer term concern with the return on investment and the sustainability of private sector participation in transport projects.

The downturn in Bank transport lending focused on PSD reforms clearly links with the worldwide trend away from private commitment for transport development. Table 1 shows the classification of transport projects by sub sector and PSD type. In 1996, 76 per cent of projects approved had PSD features, but by 2001 this had declined to 48 per cent.

Table 1: Transport Projects with PSD Reform Components: Approved 1990-2001

Type	Number of Projects
Transport Projects Approved	307
Transport Projects with PSD Components	188
Maintenance by Contract	114
Railways Restructuring and Concessions	35
Port Restructuring	24
Toll Roads and Highway Concessions	11

Source: World Bank Business Warehouse and project appraisal documents.

Between 1990 and 2001, the Bank approved 307 projects for the transport sector. Of these projects 184 (60 per cent) had PSD features either in the project description or in the loan/credit conditions.

Not all transportation projects are suitable candidates for the application of private sector finance. Low volume roads in rural areas are a typical example. There are also cases where for safety and security reasons, or to protect the environment, or to ensure a facility is operated for the public good, private sector investment would be inappropriate or unviable. In these circumstances a different set of rules should be applied to maximize efficiency. PSD projects need to be nurtured in a supportive regulatory environment and need to offer a reasonable prospect of return on investment.

Where the public sector is likely to continue to be the principal owner and investor the challenge is to create a sound institutional framework and stable financing streams. In many developing countries the lack of sustainability is due to the inability or lack of political will to allocate sufficient resources for maintenance of the facilities constructed, when faced with competing priorities for scarce funds. It has been estimated that the additional vehicle operating costs due to insufficient maintenance of African roads amount to nearly one percent of regional GDP.

The concern with the mixed experience with transport financing has led OED to consider a transport financing sector review, to be carried out over the next two years. This would be a cross-cutting initiative across all transport modes and would be based on an evaluation of the

Bank's experiences. There is a need not only to understand what lessons can be learnt from the past, but also a need to understand under what circumstances public or private financing is generally most appropriate.

6. Conclusions

Project evaluation is not an easy subject. It has to be scientifically based and the comparisons between projects have to be consistent and fair. The World Bank's approach is not unique among development agencies, but it is applied to all projects financed by the group and its results are taken very seriously by the Board of Directors. Each year there is an Annual Review of Development Effectiveness and a number of country, sector and thematic evaluations are published in addition to the project evaluations.

There is a need to catch up with evaluations in the transport sector, especially with regard to roads and highways and some of the earlier work needs to be brought up-to-date. The most urgent need is to investigate the financing issue, but other related evaluation topics are also expected to eventuate.

A few generic lessons are clear:

- Sound preparation at the outset, more than pays for itself in the later stages of implementation;
- Task team leaders nearly always overstate benefits and understate costs. This makes risk analysis very important in project preparation.
- Privatization and its derivatives will only be successful if there is political will and if there is sufficient public sector capacity to move the process to a successful conclusion.
- Some transport projects should not be run by the private sector where public safety and public good issues predominate.

It is human nature to dwell on the physical aspects of transport projects, but the real challenge is to strengthen institutional capacity and ensure sustainability into the future. This can only be achieved within the right policy framework, customized to meet the needs and conditions of the country in question and soundly based on the knowledge that the community has had a meaningful input and will generally understand and support the consequences implicit in that policy. Above all much more needs to be done to monitor the impact of transport investments on the alleviation of poverty.

References

Clare, K., and de Weille, J., 1993. OED Lessons and Practices: Railway Projects. World Bank, Washington DC.

Grosdidier de Matons, J., 1996. OED Lessons and Practices: Ports. World Bank, Washington DC.

Heggie, I, 1995. Management and financing of roads: An agenda for reform. World Bank Technical Paper No 275. Africa Technical Series. Washington DC.

Talvitie, A., and Reja, B., 1997.OED. Lessons and Practices: Urban Transport. World Bank, Washington DC.

Gilbert, R., 2003. OED Improving the lives of the poor through investment in cities. An update of the World Bank's urban portfolio, Report 25899. World Bank. Washington DC.

Baumol, Panzar, and Willig, 1982. Contestable markets and the theory of industry structure. Harcourt, Brace and Jovanovich. New York.

Spiller, P., and Cardilli, C., 1997. The frontier of telecommunications development: small countries leading the pack. Journal of Economic Perspectives, 11 (4) 127-138.