

Infrastructure Development and Economic Growth in Togo

Aboudou Maman Tachiwou

Cabinet Maitre AYEVA 05. BP.769 Lomé Agbalépédogan

LOME – TOGO

E-mail: amtwatara@hotmail.com

Ousseini Hamadou (Corresponding author)

Shanghai University of Finance and Economics

Shanghai 200083, China, Bulding 8

E-mail: diallo185@gmail.com

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Abstract

This paper provides a broad overview of the relationship between infrastructure and growth, focusing on the Togolese case. The paper develops an intuitive theoretical framework in which to analyse this relationship, identifying channels through which infrastructure may effect growth: as a factor of production, a complement to other factors of production, a stimulus to factor accumulation, a stimulus to aggregate demand and a tool of industrial policy. A framework is developed for evaluating theory analyses of this relationship, which explores the implications of different definitions and measures of infrastructure on economics growth. The empirical literature on Togo is then assessed against this framework.

Keywords: Infrastructure, Togo, Economic Growth+

1. Introduction

A nation's infrastructure development plays a significant role in its economic growth. A fast growing economy warrants an even faster development of infrastructure. Any discussion about Togo's infrastructure has to briefly cover the planning carried out for the country's economic growth, since Independence. The relationship between infrastructure and economic growth has, in recent years, become one of the most important economic topics in both academic and policy circles. At the same time, academic journals have seen a flurry of infrastructure-related publications, beginning to correct a historical paucity of South African empirical research into the growth-infrastructure relationship.

Early international studies by Aschauer (1989a, 1989b, 1989c) and Munnell (1990) found a strong positive relationship between infrastructure and growth, sparking considerable academic interest in the study of this relationship. However, their findings have been widely criticised as relying on inappropriate techniques (Gramlich, 1994) and more attention is now paid to more recent studies, which use more appropriate statistical methodology, such as those of Calderón and Servén (2004) and Estache, Speciale and Veredas (2005). Similarly, South African empirical work has progressed in the last decade from overly simplistic, of-ten inappropriate statistical techniques to more advanced and appropriate tools, particularly in the past three years.

This paper provides a broad overview of the relationship between infrastructure and growth, focusing on the Togolese case. Section 2 begins by briefly exploring some questions around the definition of infrastructure. Section 3 introduces the modelling the link between infrastructure and economic growth. Section 4 explores the efficient use of infrastructure and its effect on productivity Section 5 presents the rural and urban scenario in Togo. Section 6 develops the trade facilitation initiatives. Section 7 presents Regional Infrastructure Projects and Investment Opportunities in Togo. And section 8 is conclusions, policy directions and our recommendations.

2. Defining Infrastructure.

A formal and detailed definition of infrastructure is not necessary for the purposes of this paper (For a discussion of such definitions, see Fourie, 2006.) However, it is important to develop an intuitive understanding of the characteristics and types of infrastructure. This section develops such an understanding, while at the same time

introducing some issues of infrastructure measurement.

Infrastructure spending was historically defined as consumption expenditure by either government or the private sector but is now near-universally defined as capital expenditure, as infrastructure has been recognised as a capital good (Gramlich, 1994). Furthermore, infrastructure often possesses at least some characteristics of a public good. The owner or developer may struggle to exclude others from using it (non-excludability) and the benefits accruing to the economy as a whole typically exceed those accruing directly to the owner and even to the users (called positive externalities) (Hirschman, 1958). These are not; however, necessary characteristics of infrastructure and some specific infrastructure items may be pure private goods.

In economic terms, infrastructure may legitimately be examined as a “stock” or a “flow” variable. In the former case, attention focuses on the stock of infrastructure at a given point in time. In the latter case, attention focuses on net infrastructure creation or loss over a given time period. Whether infrastructure is measured in terms of stocks or flows, it is important that this be compared with the appropriate measure of aggregate economic performance. Both infrastructure stocks and aggregate output (typically measured by GDP) are cumulative measures and thus possess marked time trends.

Infrastructure flows and economic growth, however, are non-cumulative measures and are unlikely to possess such time trends. Infrastructure stock is thus generally compared to GDP and infrastructure flows to GDP growth, as the differing time trends may otherwise obscure genuine relationships in the data.

By convention, infrastructure is broadly divided into two categories: economic and social. The former conventionally includes transport, communications, power generation, water supply and sanitation facilities, while the latter includes educational and health-care facilities, though some authors include cultural and recreational facilities (DBSA, 1998). This classification is largely ad hoc, as many forms of infrastructure may be considered as either economic or social. Educational facilities, for example, are widely defined as social infrastructure, but play an important role in generating human capital, which is certainly also an economic function and carries important growth implications.

The two major approaches to measuring infrastructure are physical and financial. Financial measures simply calculate the depreciated value of the accumulated investment in a particular piece of infrastructure such as a road, school or power grid. Physical measures vary across different infrastructure measures: total length of paved roads, number of classrooms or total number of containers processed by a port. Constructing a single index of the physical characteristics of widely varying types of infrastructure is a difficult task, so it is common practice to use physical measures only when examining specific types of infrastructure. When examining aggregate infrastructure stocks or flows, it is more common to use financial measures. Some studies, however, use financial measures for infrastructure data disaggregated by type (Gramlich, 1994).

3. Modelling the link between infrastructure and economic growth

To quote Stephan (1997), the “published results on the productivity effects of infrastructure so far are rather ambiguous”, particularly when considering “infrastructure” as a generic input in production. Button (1998) echoes this opinion. Early studies, such as Aschauer’s several papers, used relatively simplistic econometric techniques to study the productivity effect of infrastructure, which later, more suitable, econometric techniques proved to be “spurious”.

There is generally thought to be sufficient trustworthy evidence available now to indicate a positive and statistically significant effect of “infrastructure” on long-run economic growth (see for example, the meta-analysis by Nijkamp and Poot, forthcoming). The direction of causality, and the extent and nature of the contribution, however, is still largely unsettled (Cadot et al, 2002).

Work by Fernald (1997) provides evidence that increasing the roading stock induces faster productivity growth in those industries that use roading more intensively, implying that the causation is more likely to be from infrastructure investment to output growth, rather than the other way around. Based on his cross-regional study comparing infrastructure provision in Spain and the US, De la Fuente (2000) also concludes that causality flows from infrastructure investment to economic growth, but posits that, as a “saturation point” is reached, the returns on such investment declines. He observes that:

“Appropriate infrastructure investment provision is probably a key input for development policy, even if it does not hold the key to rapid productivity growth in advanced countries where transportation and communication needs are already adequately served.”

With respect to the issue of the extent or magnitude of the contribution of infrastructure investment to productivity improvements, Gramlich (1994) makes the following point:

"If public investment really were as profitable as claimed, would not private investors be clamouring to have the public sector impose taxes or float bonds to build roads, highways, and sewers to generate these high net benefits?"

On a more technical level, Gramlich (1994) also notes, as do Nijkamp and Poot (forthcoming), that the omission of relevant variables from the analysis, among other things can lead to biased estimates of the impact of infrastructure investment on output.

Eberts and McMillen (1999) suggest that the theory on agglomeration economies "inextricably" links such economies with infrastructure by virtue of the suggestion that agglomeration economies occur when businesses / organisations in an urban locale share a public good as a production input:

"Urban public infrastructure is one such shareable input that directly affects the efficient operation of cities, particularly large cities, and thus promotes the realization of agglomeration economies. Without an efficient highway system and adequate water and sewer capacity, for example, the positive gains achieved from the close proximity of people and businesses could be completely offset by the gridlock of the movement of people and goods and the inability to meet the basic needs of densely populated areas.

Therefore, cities of identical size may experience different levels of productivity from agglomeration economies because of differences in the size and quality of their public infrastructure."

They examine the results of several studies, which generally focus either on the contribution of agglomeration economies or of infrastructure to productivity, and find that manufacturing firms are generally more productive in larger cities as opposed to smaller ones and in cities with a bigger stock of public infrastructure. This supplies evidence of the close relationship between the two, with Eberts and McMillen (1999) suggesting that infrastructure "provides the means by which the close spatial proximity of economic activities can lead to increased productivity for all parties." They make a plea for further studies to consider the two effects simultaneously and to examine the dynamics of the relationship.

4. Efficient use of infrastructure and its effect on productivity

Another focus in the literature is on contribution of efficient use of infrastructure to economic growth. Supporting the view posited by the World Development Report 1994, work by

Willoughby (2002), Hulten (1997) and Canning and Pedroni (1999) stresses the efficiency of infrastructure utilisation is important. All three posit that there may be an optimal level of infrastructure maximising the growth rate (i.e. if infrastructure levels are too high, it diverts investment away from other productive uses to the point where income growth is reduced).

Hulten (1997) takes this further by conjecturing that new infrastructure construction may not only have a limited effect on economic growth, it may have a perverse effect if it draws scarce resources away from maintenance and operation of existing stocks.

Hulten (1997) attempts to document the magnitude of the penalty of inefficiency on economic growth and finds that a 1% increase in the infrastructure effectiveness parameter generates an impact on growth seven times greater than the impact of a 1% increase in rate of public investment. He notes that this result raises the issue of whether it is the efficiency of infrastructure use or issue of general productive efficiency (i.e. in use of all inputs to production) that is required.

Taking a different tack, Canning and Pedroni (1999) examine 100 developing and developed countries, using physical measures of infrastructure (i.e. length of paved roads, kilowatt hours of electricity generating capacity), and find that there is no evidence of worldwide infrastructure shortage of telephones or paved roads (though some under- or over-provision occurs in less developed countries). They do find that there is an under provision of electricity on average across the countries and individually for various countries. Based on their analysis, Canning and Pedroni (1999) argue that the "policy relevant" question for infrastructure investment is not "what is the effect of extra infrastructure, holding everything else constant?" but "what is the net effect of more infrastructure taking into account that infrastructure construction diverts resources from other uses?" This would imply a national benefit-cost framework that makes explicit tradeoffs between different types of infrastructure investment, not just the different options for a given type of infrastructure.

Stephan (1997) found that other exogenous factors are more relevant than the growth of road stock (measured in length of paved road) in explaining TFP growth differences between eastern and western parts of Germany. Also, he postulated that increasing the road stock does not necessarily correspond to effective capacity growth, implying that the capacity utilisation of roads should be taken into account as well in assessing contribution to TFP growth.

Murillo-Zamorano (2003) decomposes productivity growth into technological progress and technical/economic

efficiency change in order to analyse the relationship between energy consumption, both sources of change, and productivity. She finds that technical efficiency in energy use seems to explain a significant part of temporal evolution and cross-country variability of aggregated productivity growth, suggesting that reliance on the “identification of productivity growth with technological progress” may not provide appropriate results in an analysis of factors affecting productivity.

5. Togo’s rural and urban scenario

It is 50 years after Independence. Today, the rural population accounts for nearly 75 per cent of the total population and nearly half of them still live in poverty and illiteracy. How good is the rural infrastructure? One fourth of our villages do not have electricity; only 20 per cent of them get tap water; 60 per cent of them are more than 15 km away from the nearest health centre; one third of them do not have pre-primary schools and 80 per cent do not have post offices! Yes, “Togo still lives in its villages”.

The cities shelter around 50 per cent of the population who contribute to the economic growth. However, the most vital part of economic growth, which is infrastructure, hardly matched the demands of even this 50 per cent of urban dwellers, spreading chaos at the slightest provocation with the danger of turning the clock backwards.

Togo's main port and growing road transport sector have an important role in the sub-regional economy. The commercial and transport sector earns 35 percent of Togo's GDP. Togo has 9,600 kilometers of roads, 1,600 kilometers of which are paved. The World Bank has introduced a US\$200 million transport infrastructure program, which was instituted in 1997. Parts of the 700 kilometer north-south road (the main road to Burkina Faso) have already been rehabilitated. The main east-west road which links Togo to Benin and Ghana also has money earmarked for rehabilitation. The railway network is limited and needs modernizing. There are 275 kilometers of track leading from Lomé to Blitta, and 262 kilometers from Kpalimé to Aného.

Lomé's deep-water port has benefitted from under-capacity in other countries and competes successfully within the region. In the 1970s the port grew rapidly, reflecting increased trade with Niger, Burkina Faso, and Mali. Togo's social upheaval and a general regional economic downturn has led to a trade slump, with re-exports dropping from 2.7 million metric tons to 1.1 million metric tons in 1993. Under a government privatization program, new installations are planned, including computerization to speed up loading and unloading in order to make the port competitive.

Telecommunications are operated by Togo Telecom, which is a parastatal. Togo Telecom sought to increase the number of telephone lines in the country from 21,500 in 1998 to 600,000 in 2010. The company has been slated for privatization since 1997. One of its subsidiaries, Togocellulaire, manages the digital network, which had more than one million subscribers by the end of 2010.

6. Trade facilitation initiatives in Togo

In an effort to improve its economic performance, Togo is pursuing economic integration through several bilateral and regional trade protocols. Currently, Togo is a member of the Economic Community of West African States (ECOWAS) and West African Economic and Monetary Union (UMOA) Regional blocks. Currently, Togo has concluded a customs union with many African countries, as a way of facilitating trade amongst the member states.

Most of the constraints to cross-border trade and investment are considered to be related to the limited development of transport and communications networks in the region and to inadequacies in the rules and regulations governing trade, payments and investment in different countries. The UMOA and ECOWAS member states are trying to address this bottleneck. Under UMOA, a number of common transport and communications programmes and projects aiming at simplifying transport and communications in the region are being developed. One of the main objectives of Togo's Development Vision 2025 and those of UMOA and ECOWAS partner States is to attain faster economic growth in order to reduce and in the long run eradicate poverty. In order to achieve faster growth partner States must improve infrastructure and its services, hence increase trade volume especially external trade.

However, increase in external trade demands that exports must be competitive in the world market and their inputs from the productive sectors be obtained at lowest possible prices.

Among the major contribution of the cost of inputs and consumer goods as well as the price of traded goods, is the cost of transport. The cost of transport in the region is high. The cost of Transport is four to five times as compared to the cost in developed countries. For landlocked countries, the cost accounts for 40 - 60 per cent of the price of goods. Low levels of the intra-regional trade in the region are a result, of among other things poor transport and communications infrastructure. It is the desire of Togo to reduce transportation costs with the objective of achieving competitiveness, poverty alleviation, and development.

The major thrust will be towards: Improving road and rail network, improving marine and air transport, minimizing boarder posts delays, reducing insurance costs, attraction of investment in infrastructure development, involvement of private sector in infrastructure operation and service provision, effective legal and regulatory reforms.

7. Regional Infrastructure Projects and Investment Opportunities in Togo

7.1. Regional Infrastructure Projects

One of the strategies to address some of the above issues is through regional development projects. Some of the major projects, which are going on in West Africa community with view of improving infrastructure, are as follows:

Air transport: After the events of September 11, 2002 in Washington and New York, the twin issues of safety and security have formed an important ingredient in air travel. Towards this end Togo in collaboration with other Africa countries has embarked on complementary projects, like: the African Civil Aviation Project. The Civil Aviation Project entails a study on the establishment of Africa Upper Flight Information Region, Search and Rescue region and an international NOTAM office among others.

Road Transport: There are many major projects in the road transport as follows: West Africa Road Network project, which is about 5640 km, requiring about US \$ 5 Billion (see Table 1). The objective of this project is to develop cross border links with a view to facilitate trade. The corridor links on Togo part are: Lome – Atakpame – Sokode – Kara – Dapango: Cinkasse (722 Km) and Aflao – Lome – Illakondji (56 km)

Railways: The UMOA is involved in the Assessment of the Restructuring of the west African Railways. The objectives are;

- * To assess the state of restructuring of railways in the three Partner States in areas of ownership, management, infrastructure, financing and investment, national legislation and human resources; and
- * To recommend a harmonized approach towards restructuring the railways in the region and possible areas of co-operation during the restructuring process.

Lakes and rivers safety of Navigation Project: The project involves defining new Legislative and regulatory framework and introducing the necessary tools and structures for the implementation of this legal framework relating to ship inspection, search and rescue, aids to navigation and Hydrographic survey.

Postal Automation Project: The project involves computerization of the Postal counters in whole states. Phase 1 of the project is fully implemented. The postal counters of the whole states are now connected.

7.2. Investment Opportunities in Togo

Togo has increasingly put in place, the environment necessary for attracting foreign investments mainly Private capital flows through: liberalizing the economy, adopting appropriate macroeconomic policy frameworks by improving infrastructure and public service delivery, addressing issues of good governance; it also called an investment destination because of: its long-term peace and political stability, and its geographic location that provides the shortest route to some of the landlocked countries, short active Coastal line, large area of inland waters, air corridor. In order to accelerate the rate of economic growth, Togo invites private sector participation in the following areas of investments.

8. Conclusions, Policy Directions and Recommendations

8.1. Conclusions

Togo Government is committed to the continued development in a liberalized economy. The Government recognizes that private sector is the catalyst of Togo development growth and that if poverty reduction goals are to be achieved; significantly strides must be made in private sector development for both indigenous and foreign direct investment through reforms on: Central and local taxation; Labor laws; Land planning allocation and development.

The Government will continue to address good governance issues to sustain the existing peace and security. The Government will strengthen relation with ECOWAS, UMOA and other region economic groups in pursuing development goals by removing physical and non-physical barriers on transit trade

Both theoretical and empirical evidence thus point to the existence of a robust positive relationship between infrastructure and economic growth. However, this does not amount to a general argument in favour of infrastructure investment by either government or the private sector. As Perkins, et al (2005), emphasize, different types of infrastructure may be particularly beneficial for growth at different times and under different circumstances. It is thus important that the proposed infrastructure spending is subject to thorough cost-benefit analysis and carefully takes into account the areas in which infrastructure is in greatest need of upgrading. Infrastructure plans must also take into careful consideration the forecasted investment levels required to sustain particular growth

targets. Finally, the relationship between infrastructure maintenance and economic growth remains almost entirely unknown, both internationally and in South Africa (Kessides, 2007), and this issue requires considerable attention in order to develop a comprehensive understanding of the infrastructure-growth relationship.

8.2. Importance of Sustainable Infrastructure

Infrastructure is a key element for realizing sustained economic growth and sustainable development to achieve the Millennium Development Goals (MDGs), and in particular, MDG 1 (Poverty Reduction) and MDG 7 (Environmental Sustainability). The unmet demand for social and physical infrastructure to support the delivery of housing, transportation, energy, water services and to overcome the deficiency of food limits economic opportunity and is therefore a major barrier to the achievement of MDG 1.

Patterns of infrastructure development determine the environmental sustainability of “green” economic growth. In turn, eco-efficiency should be one of the key criteria for the development of sustainable infrastructure. Eco-efficiency of infrastructure has long term and significant impacts on both economic and environmental sustainability.

Currently, many developing countries are at the cross road of developing and further expanding their infrastructures in support of robust economic growth. This is an opportune time for them to adopt and apply eco-efficiency concept in their infrastructure development

8.3. Policy Directions and Recommendations

After discussing various experiences and policy options of infrastructure development, the First Policy Consultation Forum conclude that:

- It is necessary to develop sustainable infrastructure development policies and strategies, taking into account the eco-efficiency concept that includes all aspects of infrastructures and also seeks to merge and combine such systems, such as transportation and energy;
- A holistic approach is needed in infrastructure development, considering both consumption and production aspects, physical and non-physical aspects, different stages of infrastructure development, different levels of organizations, and role of different stakeholders;
- Conventional Environmental Impact Assessment (EIA) is not enough to reflect the long-term environmental impact of infrastructure development. Thus, Strategic Environmental Assessment (SEA), which takes into account the long-term ecological impact of infrastructure, can be an important policy tool in promoting sustainable infrastructure;
- Green GDP can be a useful tool in promoting green growth in that it makes possible to measure pollution cost. However, it has also a limitation as the valuation of environmental degradation is difficult and it does not cover the social cost causing from inefficient use of resources;
- The technical expertise of the private sector in development of infrastructure will definitely be beneficial. However, the private participation does not automatically guarantee the promotion of sustainable infrastructure. The private participation in infrastructure development needs to be carefully evaluated and scrutinized;
- It is necessary to develop strategies for attitude change, including education and awareness raising and ensuring decision making processes that give conscious attention to environmental and social objectives;

*** Water**

- There is a need to apply eco-efficiency concept into water infrastructure development. Not only efficiency of infrastructure investment but also eco-efficiency of operation and maintenance of water infrastructure need to be improved;
- Opportunities for improving eco-efficiency in water infrastructure include reducing water demand by increase public awareness, applying integrated water resource management, increasing water recycling, and minimizing water loss;
- New paradigm for rainwater management is required in order to maintain environmental sustainability and mitigate flooding and drought. Rainwater could be the main source of water supply with less energy input;

*** Energy**

- There is a need for developing countries in the region to include a goal such as “enhanced energy independence” in their infrastructure development plans so that local and renewable energy resources may be used to generate power for buildings and fuel for transportation. Two key components are the need to diversify energy supplies so that one

source does not dominate and hence control the market demands. The other is to start investing in development of renewable and sustainable energy resources now rather than later;

- Climate responsive building design codes applicable to each country need to be developed. This could reduce the cooling demands in the countries, which most likely will increase in the years to come. Such climate responsive building design code will have the goal to reduce the heat gain, while using natural ventilation and natural cooling;
- Eco-efficient and effective air-conditioning systems need to be developed, taking into account the climate of the countries and the use-side of energy efficiency;
- It is necessary to develop energy efficiency strategies in respect to which will increase awareness and education in housing and building design and householder behavior (e.g. insulation, choice and use of heating systems, dryers, lighting, and hot water);
- The energy sector is a good example of how “agile energy” infrastructures can be created that combine “central grid” and local “on-site distributed” energy from renewable energy transmission over lines from long distances to local green building complexes that use energy conservation, efficiency and solar energy;

* **Transport**

- It is necessary to work towards improving the eco-efficiency of transport sector by developing and realizing an appropriate vision of eco-efficient and sustainable transport firmly rooted in the concept of green growth;
- Regional approach to promote eco-efficient and sustainable transport is needed, in such areas as regulation, technology, and innovation. In order to move towards eco-efficient transport systems, it is necessary for the countries in the region to develop guidelines for eco-efficient and sustainable transport based on local traffic and land use conditions.

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Table 1. Checkpoints along Intra-ECOWAS Highways

High Ways	Distance	Check points	Check points/Security per 100 Km
Lagos - Abidjan	992 Km	69	7
Cotonou - Niamey	1036 Km	34	3
Lomé - Ouagadougou	989 Km	34	4
Accra - Ouagadougou	972 Km	15	2
Abidjan - Ouagadougou	1122 Km	37	3
Niamey - Ouagadougou	529 Km	20	4

Source: ECOWAS official site 2003