



Impact of The Public Expenses' Infrastructures on The Economic Growth of Developing Countries

KEYWORDS

endogenous growth - Public expenditure – State - Infrastructures.

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ABSTRACT *The model put forward by Barro for the theoretical analysis of the links between public capital and growth is now providing a reference framework for the economic literature. The originality of this model lies in the fact that it shows the public capital stock in the production function, so as to highlight the externalities that justify the importance of state intervention in the productive activity. Indeed, if this model was able to provide compelling results in the case of developed economies, the empirical evidence seems controversial in the developing countries. This lack of robustness would probably derive from certain characteristics in developing countries, including, among others, lack of quality data, weak economic governance, fiscal policy, low spatial diffusion...*

Introduction

The literature on the role of the State in the economic growth is abundant as this is witnessed by the numerous empirical researches related to it. Being sometimes overshadowed till the end of the 1970's, this debate comes in the front framework of theories on the growth during these current years. As a matter of fact, until the beginning of the twentieth century, the economical trends which follow one another (mercantilist, physiocrat and classicist) gave few significance to the State in the process of the growth (Darreau and Pondaven, (1998).

In this case, according to the classicists, the State's interference in the economical mechanism is perceived as source of distortion disrupting the normal functioning of the market.

However, with the 1929's crisis, this consideration showed it deficiency. Then, one goes along with Keynes (1936) that the State could play an important role in the process of the economic growth.

In the extension of Keynes's theory during the 1940 and 1950's, the role of the infrastructure in the economic activity has been taken down to the centre of debates on the growth with new theories. One may, specially, quote works by the forerunners Rosenstein-Rodan (1943) responsible of the theory of "big-Push" which was on the necessity of an initial investment by the State, then works by Nurkse (1952) related to the theory of the balanced growth and other works by Hirschman (1958) on the theory of an unbalanced growth¹.

All these theories on the Keynesian thought seem bringing more or less innovative notions on the role of public investment of infrastructures in the economic growth. But, since years, the theoretical interpretation of this thesis has considerably been refined with new growth's theories of which works by Barro (1990).

These works integrate into the analysis the productive role of investment in public infrastructures. The theoretical model presented considers public infrastructures as a necessary prolific factor for the economic activity.

Behind Barro, several attempts of empirical experimentations of the relation between public expenses in infrastruc-

tures and the economic growth have been undertaken either to confirm Aschauer (1989), Charlot (2000) or to invalidate Lee (1995), De Gregorio (1996) this thesis. The purpose of this article is to search for the possible explanation justifying this controversy particularly when it is about to test this theory in the developing countries.

The endogenous growth's theory prompted by Barro

The endogenous growth's theory rejects the State's economic policies and finds out on the contrary that this can encourage the growth in long term. This new theory uses the means of analysis of the liberal theory. It gives a great significance to the external effects of which those produced by public infrastructures which are perceived as the founding justification of the State's interference (Barro, 1990).

According to Barro (1990), by investing in the infrastructures, the State is improving the productivity of firms and directing the economy towards a higher growth of the total product. In doing so, the public and private sectors become complementary.

The model suggested in order to illustrate this relation constitutes today a major contribution in the economic literature. The specificity of this model consists in arising the stock of public wealth in the production process and consequently to put in a prominent positions an explicit link between the State's policy and the long term economic growth in an endogenous growth's framework. The model of endogenous growth with externalities leans on functions of production having three factors of production namely; two private sectors (work and private capital) and the third factor, public expenses in infrastructures. The functional form, regularly used, is the Cobb-Douglas one. This has the advantage to allow a direct reading of elasticities and the outputs' scale and an easy discussion of the presence or non presence of public wealth's externalities. As a matter of fact, there are externalities engendered by factors if the outputs' scale are decreasing or constant in private factors and increasing on the whole factors, private and public (Barro, 1990).

At the end of his works, he remarks that the nature of the growth bound to the public expenses is actually an externality. The service of an agent, specially, the State has some effects on another agent's service, the private firms.

Basing on Barro (1990), the public investment in infrastructures is apprehended as an improvement factor for productive performances and the investment of the private sector. The practices of empirical verifications of this positive relation between public infrastructures and economic growth are nevertheless numerous and spread on developing countries as well as on the developed ones.

Literature Review

The first empirical study goes back to Aschauer (1989). Starting with a research based on Americans' data, this author explains the decline of the American productivity in the 1970's by the reduction public efforts in infrastructures. By using a function of an increased production to the public capital (the public capital is generally used as public infrastructures' indicator and it represents the stock of public infrastructures), Aschauer finds statistically significance the elasticity of the production in comparison with the stock of the public capital. This shows that when the public capital increases to 10%, so is the production with 39%.

Basing on the same data as Aschauer, but taking into account the nature of the output's scale, Munnell (1990) finds elasticity comprised of 31% and 39%. While confirming Aschauer's results, Munnell goes further in showing that the deceleration of the productivity of private sectors admitted formerly rather comes from the omission of the public capital in the function of production. Once the externalities associated to the public capital take into account, the author reveals that the reduction of the moderate productivity of the work from 1969 to 1987 passes from 1,4% to 0,3%.

Behind Aschauer and Munnell, Finn (1993) considers that the level of elasticities found by these authors seem higher. He then goes beyond the framework of the partial balanced approach approved by his two predecessors to suggest an estimation of the productive contribution of the public capital within the framework of a structural balanced model of a general dynamic stochastic. At the end of these researches, he comes to the conclusion that the higher level of estimation of Aschauer is on the definition of the public capital which contains non productive components (like museums and prisons). According to him, only the capital held by public firms as well as the stock of road and superhighway infrastructures can directly affect the productivity of private firms.

Brox and Fader (1990) use data from four Canadian provinces to analyze the effect of the public infrastructures on the structural costs of manufacturing sectors' firms. The elasticities of the cost at the public infrastructure are statistically significant and negative. The values found are respectively from 0,481; 0,156; 0,237; 0,115 showing for example that in the first province an increase of 10% of the public infrastructure's capital reduces the production cost of manufacturing sectors' firms by 4,81%.

Charlot and Schmit (2000) have later on also used French data to put in a prominent position the productive effect of public infrastructure on the economic growth. The elasticity (statistically significant) of the production to the public capital found by these authors is 0,321 confirming then the influence of the public capital's thesis investment on the economic growth.

Recent researches by Afonso, Ebert, Schuknecht and Thone (2005) have shown that if the public expenses are of high quality, then the services produced are efficient and

can generate the economic growth.

Unlike all these studies having adopted aggregate indicators of public infrastructures and more or less temporal series, Veganzones (2000) on a specimen from 87 countries has also used a global indicator and disaggregate indicators to come up to the same conclusion.

Basing also on econometrics techniques of data sample group, other authors take interest of the effects of the public investment on the productive activity through well determined common specimen.

This is the same case experimented by Evans and Karas (1994) on seven countries from OCDE in a function of production at the first differences. The authors get an evaluated elasticity of the production to the public capital relatively higher of 18% and conclude that the countries benefiting from the growth rate of GDP are those that structurally have important subsidies in both private and public capital.

On the other hand, some researches -certainly by way of exceptions which confirm the rule- done in the same way on developing countries especially some economies from OCDE have shown, contrary to the theory, that the public expenses of the State have a negative effect on the growth. One may mention as examples works by Lee (1995) on 16 countries from OCDE, De Gregorio (1996) on 21 countries from OCDE, Fölster and Henrekson (1999) on 23 countries from OCDE, de Bassanini Scarpetta and Hemmings (2001) on 21 countries from OCDE, Heitger (2001) on 21 countries from OCDE.

Basing on this short empirical literature review, one could be urged to draw as conclusion that in general, the public infrastructures play a productive role in the growth of an economy. However, the verisimilitude and the harshness of precedent results (especially those of Aschauer and related works) have received particular attention of a number of more or less important critics (Veganzones, 2000).

It was Tatom (1993b) who first asked himself on the strong impact suggested by Aschauer. He then worked out the marginal productivity of the public capital which value is situated between 60 and 80%. This result, according to him, seemed very surprising inasmuch as this productivity would be twice stronger than that of the private capital. This interested remark will arouse numerous reactions originally responsible for the methods of econometrics estimation related to Aschauer's works.

The first concern evoked by way of critics is about the non stationary of series entering in the function of the production (Tatom, 1991 and 1993a). The resolution of the non stationary problem goes through the estimations' methods at the first differences adopted by several authors such as Tatom (1991), Hulten and Schwab (1991), Sturm and De Haan (1994), Ford and Poret (1991) still, mainly, on chronological series which call Aschauer's results in question. On the other hand, as stated by Munnell (1992), there is no reason to preferring estimations at the first differences in so far as this process excludes an eventual relation of long term between public and private production. Theoretically, this long term relation should be evaluated by techniques of co-integration (Veganzones, 2000).

The co-integration approach borrowed by Argimon and al. (1993) for Spain, Otto and Voss (1996) for Australia gives

on the other hand some more elasticities of 0,59 and 0,30 to the public capital (0,17 with constant outputs). Coming back to the United State's case, Kocherlakota and Yi (1996) get some elasticities of 0,065 for the public equipments and 0,18 for the infrastructures. Ai and Cassou (1995) who combine a differentiation of series with an estimator of generalized moments, evaluate an elasticity of 0,15 to 0,39 according to the specification of the outputs' scale.

A second wave of irrelevant reactions also related to the sense of causalities between public infrastructures and growth, that is the possible endogeneity of the variable infrastructure, have been stated. According to the Wagner law, it is the economic development and the growth which responsible for the increase of the State's expenses. This rise would especially be associated to an increased inquiry of public services and the most important financial resources of the State. There would be then an opposite causality to the double causality between infrastructure and growth which would cause a means of simultaneity during the evaluation of the function of an extended production.

Several authors were interested in the question of the endogeneity of expenses and public investment in works mainly in data panel. The thesis of the opposed causality is approved by Ahsan, Kwan and Sahni (1989, 1992), Tatom (1993a) for the United States and Conte and Darrat (1988) for a specimen of 10 countries from OCDE. Nevertheless, one blames the tested indicator namely the aggregate public expenses not to be able to serve as adequate proxy of infrastructures.

At last, let's point out that this quick review highlighting some viewpoints, as far as the possible impact of public infrastructures on the economic growth is concerned, shows the whole complexity of this problematic. What about exactly the the developing countries and particularly the African economies in the south of Sahara where studies dealing with this thesis seem not much?

Teaching of the implementation to the developing economies

Most of the studies based on the developing economies resulted in mixed conclusion. The empirical obvious fact of the relation between the public investment and the growth in the developing countries remain ambiguous. The researches show a large variability of the estimated results (Nubukpo, 2003).

Greene and Villaneuva (1991) have studied the impact of the public investment on the private sector in considering a specimen of twenty three developing countries during the 1982 to 1987. In concluding that the public investment positively affects the private investment, the authors evaluate that the two types of investment are complementary.

Contrary to the precedent result, Islam and Wetzel (1991) value that in Ghana, the public investment supplants the private sector unlike the strengthening or the complementary action expected from him.

In Nigeria, Ekpo (1994), took interest in the contribution of public expenses in capital in relation with the economic growth during the 1960 to 1992. The results have shown that the public expenses, mainly those in capital, have a strengthening effect on the private investment, what in fact has a significant effect on the economic growth. According to Barro's approach, what in fact justifies the regulating role of the State's action is the third lever of the econom-

ic growth. That author therefore found that the expenses made in the manufacturing sector had an eviction effect on the private investment instead of a complementary effect.

In a study inspired by Barro's model (1990) on three public sectors (infrastructure, human capital and consumption) by the side of the private sector, Herrera (1996) has obviously put in a temporal approach the productive contribution of infrastructures to the growth of GDP in India and in Pakistan. However, the result's robustness found remains limited by the persistence of multicollinearity between the utilized variables.

Ojo and Oshikoya (1995) have shown through a study based on sub-Saharan countries that a rise of public expenses reduces the growth of GDP per country. Ténou (1999) also comes out to the same result in the case of countries from UEMOA. Considering the ratio of the budget deficit rather than that of the consumption of public expenses, Ghura and Hadjimichael (1996) have found out a sample of African countries in the south of Sahara, a negative and significant relation with the growth rate of the GDP per country.

Ghali (1998) considers a VAR model and applies some tests of causality in the way of Granger on the Tunisian data from 1963 to 1993. The results show that in a short as well as a long term, the public investments have a disastrous effect on the private investments but not on the growth.

On the other hand, basing on a general balanced worked out analysis, Dumont and Mesples-Somps (2000) have examined the impact of infrastructures on the competitiveness and the growth of Senegalese economy. The authors have been able to show the positive effects of a policy of public infrastructures' expansion on the commercial performances of manufacturing sectors and consequently on the growth.

As for Khan and Kumar (1997), they have shown, by using a sample of 95 developing countries on the period 1970-1990, that the effects of private and public investments on the growth were significantly different. The authors came to the conclusion according to which the private investment is constantly more productive than the public investment.

Basing their analysis on a study per sections which deals with a sample of 119 developing countries, Easterly and Rebelo (1993) have said that the public investment in transport and communication was positively linked to the growth. However, what contrasts with their conclusion according to which the public investment has a disastrous effect on Agriculture and no significant effect on public firms.

This result's variability of the surveyed researches shows how the empirical evidences of the relation between public investment in infrastructures and the growth (development) in developing countries lack strength. If structural elements, characteristic of developing countries like organizational aspects, can show such a thing, several explanations need to be looked for in the structuring of the layout of economical policies lead by those countries.

In fact, first of all, it is important to remind that, as any production factor, the spending in infrastructures are also subjected to a decreased productivity. For that purpose,

their impact, to a certain extent, may seem inefficient. In fact, as a sample of developing countries, Devarajan, Swaroop and Zou (1996) have got controversial evidences between the public investment and the growth. When analyzing the probable reason of such an inadequacy, those authors reckon that the States might have granted bad resources of allowance in favor of expenses in capital (to the detriment of servicing infrastructures' expenses). This preoccupation leads Nubukpo (2003) to make with the determination of optimal ratio of the formation of public and private a central preoccupation of economical policies in developing countries. This matter about the capacity of a developing State of mastering the relative weight as well as the efficiency of public investment programs has also been tackled by Hulten (1996) who built and tested an efficiency synthetic variable of infrastructures usage, from the four indicators of equipments' quality (to be specific, the loss rate of electricity production, the percentage of the good state of roadway, a percentage of diesel locomotive and the failure rate of 100 telephone calls). Experienced on a sample of 42 developing countries, this method gives rise to a very significant specification that has improved notably the quality of estimations.

The controversial nature of the result in those countries could then, depend on the feeble level of equipment in infrastructure, itself due to the insufficient resources that those countries have. Also, does a survey lead by Shah (1992) on a sample of 26 Mexican industries confirm this issue. At the end of the study the author having been to a weaker impact of public infrastructures on the production comparing to the private one, concludes a very bad quality of Mexican State's infrastructures. Elhance and Lakshamanan (1988), in their part, highlight an adjustment of the private investment inferior to the optimal level, in six manufacturing industries in six States of India. The result obtained from the study shows a deficit in infrastructures, due to 'the poverty' of the concerned States.

Moreover, it is said that the public investment's infrastructures in case it is complementary to the private investment, can increase the marginal product of private capital, this consequently increases the economic growth rate. Some points needed to be shown whether the public sectors' activities are challenging that of the private sector. This can lead to a substitution or an eviction. These in their turn can explain the disastrous results on the growth. This remark seems to be pertinent to the developing countries' economy. It may be the interpretation that one could make of the results of Ghali (1998) when working on Tunisian's data. As far as Alogoskoufis and Kalyvitis (1996) are concerned, they make remark that there are three kinds of public investment objectives that they sum up as follow. In the first case, the authorities set the ratio of the public capital according to the GDP. The model resolution makes appear a long lasting dynamic of the growth, determined by a private investment itself example of a positive level of the public capital. In the next two cases, the authorities set an objective either of the public capital growth rate or the private capital ratio of the public investment to the GDP. So it is the growth rate of the public capital that determines the balanced growth rate of the economy. The private capital ratio is then slowly fit to the public capital to a long term; the private investment is gradually increasing due to the higher marginal productivity in the presence of the increased public investment. In a long term, the growth rate of the private investment is higher. It is the same with that of the public investment (Veganzones, 2000).

Another consideration could involve the variance of the tax policies made use of those economies. The impact of the public investment on the growth can be the result of the tax used by the financier. If it is for instance financed by the increased of direct taxes, the net impact on the growth can be disastrous, in spite of positive impact on the marginal productivity of the capital. As consequence, the tax rate plays a contradictory role, by shortening the private capital's profit and discourages the investment. This situation is led to under-optimal of the economy: growth rate, due to the fact that firms use the public investment as data (Veganzones, 2000). The action of the State, third lever of the growth, should aim at boosting the two other levers which are capital and work. Consequently, a high taxation does not contribute to the development of the tax that is a tax in service of the economic growth. The non resistance can also be a source of the bad ruling which could be object of the public expenses in those countries. According to this hypothesis, the real destination of the problem is still put. The public expenses that have for instance been used to finance a scruffy or non productive of the capital investment projects, could not lead to good results. This preoccupation leads Jacquet and Charnoz (2003) to recommend that the planning of infrastructures stress both the production services and the leading impact that their setting up generate in the economic activity. For example, illustrating their ideas with the road network which planning must not be done (or not only according to the number of kilometers, they suggest that one mainly take into account other variables like the opening up of profit, the decrease of transport cost, the economic flow likely to be generated etc.

As far as the bad ruling chapter is concerned, one may also mention the round about the expenses turned away from their initial objective (productive investment). It then raises the worrying case of the ruling of public expenses in infrastructures in the aforementioned economies. This probability has been confirmed by Rajkhumar and Swaroop (2002) who worked in panel (1997). At the end of an international comparison, these authors observed that the good ruling affects positively the efficiency of public expenses investment. As for Elhance and Lakshaman (1988), they recommend a concentration of the public investment on the physical infrastructures, these ones being more productive than the social infrastructures.

The poor spatial spreading of the growth impact in the developing countries can also explain that disparity of results. If there is a well known feature of developing countries in the international trade, this means that the developing countries exchange few. But the spatial spreading of the growth represents another means of transmission of the role of infrastructures. It is in fact obvious that a country or a region will benefit of infrastructures from its neighbors which will especially allow him to have access to new market, to import technology at cheap expense or to participate to a certain regional division of work (Veganzone, 2000). However, in the case of developing countries, this canal could not give all its effects. The reason is that those countries are first of all relatively poor to generate the growth form their own investment. Next, most of them are mainly characterized by the same level of development in such a way that marginal impact remains weak.

Moreover, the poverty of data can according to me be the probable cause. In fact it is today more obvious that the informal sector, hardly seizable in the official statistics, represents a major part of the developing countries' econo-

my. The preponderance of an underground economy and the fact that it escapes from data collections' operations, it represents a major hindrance for the establishment of a reliable relation between the public expenses in infrastructures and the growth of the economic activities. The empirical researches' verification of a theory become in fact relevant if they are supplied with credible information but in the case of several developing countries, the informal sectors prevails the economic activities in such a way that numerous data do not sometime match with the realities. The perennial integration of information on the informal sector in the statistical regulation devices remains as well a preoccupation not to be put aside. For us, this spoils the verification of Barro's empirical theory; the source of the endogenous growth in the developing countries.

Conclusion

The central idea that appears from this study is that there exists an important literature devoted to the role of the state on the production. The analysis is mainly focused on the developed economies where more convincing empirical results of the public expenditure in investment in the economic dynamic revealed themselves rich in teaching. The specific case of the developing economies remain controversial even if the problematic is relatively less studied. In fact, if the Barro inspired theories (1990) seems to generate not only mitigated results, most of the countries research ways concerning on the one hand, to most appropriate statistic data and on the other hand to the consideration relating to the capacity of the state that to put into practice efficient economic policies seem pertinent. Foairy (2003) made people notice that the choice of public investment must be based on the taking into consideration the interactions and synergies between the focused projects and the existing activity and all the policies and the regulating policies sensitive to influence the profitability. The question of the governance, of poverty of the data, must neither be occulted. Moreover, the quality of the materials or the under equipped seems also a way to be explored. These observations, that are often the "daily lot" of many developing countries. Without any doubt factors not quite favorable to the validity of the approbation of the role of infrastructure in the growth.

References :

- AFONSO A., EBERT W., SCHNKNECHT L. et THONE M. (2005), *Quality of Public finance and Growth* European Central Bank, Working Paper Series N° 438.
- Al C. et S.P. CASSOU (1995), *A Normative Analysis of Public Capital*, Applied Economics, pp.1021-1209.
- ALOGOSKOUFIS, G.S. et SC KALYVITIS (1996), *Public Investment and Engogenous Growth in a Small Open Economy*, Discussion Paper, N°1479, CEPR, Londres, septembre.
- ARGIMON, I., J.M. GONZALES-PARAMO, M.J. MARTIN et J.M. ROLDAN (1993), *Productivity and Infrastructure in the Spanish Economy*, Working Paper, N°9313, Banco de Espana, Servicio de Estudios.
- ASHAN, S.M., A.C. KWAN et B.S. SAHNI (1989), *Causality Between Government Consumption Expenditure and National Income: OECD Countries*, Public Finance, N°2, pp1204-224.
- ASHAN, S.M., A.C. KWAN et B.S. SAHNI (1992), *Public Expenditure and National Income Causality: Further Evidence on the Role of Omitted Variables*, Southern Economic Journal, Vol. 58, pp. 623-634, janvier.
- ASCHAUER, D.A. (1989), *Is Public Expenditure Productive?*, Journal of Monetary Economics, Vol. 23, pp. 177-200, mai.
- BARRO, R.J. (1990), *Government Spending in a Simple Model of Endogenous Growth*, Journal of Political Economy, Vol. 98, N° 5, part II, S103-S125, octobre.
- BASSANINI, A.; SCARPETTA, S. and HEMMING, P. (2001). *Economic growth: the role of policies and institutions. Panel data evidence from OECD countries*. OECD Economics Department Working Paper 283, Paris.
- BROX, A.J. et FADER, A.C. (1990) *Public infrastructure, regional efficiency and factor substitutability in Atlantic Canada Manufacturing*. Journal of Monetary Economics.
- CHARLOT S. et SCHMITT B. (2000) *Infrastructures publiques et croissance des régions françaises*. UMR, INFRA-ENESAD
- CONTE, M.A. et A.F. DARRAT (1988), *Economic Growth and the Expanding Public Sector: A Reexamination*, Review of Economics and Statistics, Vol.LXX, mai, pp.322-
- DARREAU, P. et C. PONDAVEN (1998). *Problèmes économiques et sociaux contemporains*. Cujas, Paris
- DE GREGORIO, J. (1996), *Inflation, Growth and Central Banks: Theory and Evidence*, The World Bank, Working Paper 1575, Washington D.C.
- DEVARAJAN, S., V. SWAROOP et H.F. ZOU (1996), *The Composition of Public Expenditure and Economic Growth*, Journal of Monetary Economics, Vol.37, pp.313- 344.
- DUMONT, JC et MESPLE-SOMPS, S(2000), *L'impact des infrastructures publiques sur la compétitivité et la croissance : Une analyse en EGC appliquée au Sénégal ; DT/2000/08, DIAL 2000*
- EASTERLY W., REBELO S. (1993) *Fiscal Policy and Economic Growth : An Empirical Investigation*, Journal of Monetary Economics, (32), Décembre 1993.
- EKPO, A.H. (1994) *Fiscal Federalism: Nigeria's Post-independence Experience, 1960-90* World Development, Vol.22, No.8, August, pp.1129-1146.
- ELHANCE, A.P. et T.R. LAKSHAMANAN (1988), *Infrastructure-Production System Dynamics in National and Regional Systems: An Economic Study of the Indian Economy*, Regional Science and Urban Economics, Vol. 1
- EVAN, P. et G. KARRAS (1994a), *Is Government Capital Productive? Evidence from a Panel of Seven Countries*, Journal of Macroeconomics, Vol.16, N°2, pp.271-279.
- FINN, M. (1993), *Is All Government Capital Productive ? Economic Quarterly*, Federal Reserve Bank of Richmond, Vol.79, N°4, pp.53-80.
- FOIRRY, J-P (2003), *Le choix des projets d'investissements publics : limites de l'analyse coûts avantages et intérêt d'une approche planificatrice (application au secteur de la santé)*, CERDI.
- FORD, R. et P. PORET (1991), *Infrastructure and private sector productivity*. OECD Economic Studies. Vol. 17, pp. 63-89.
- FOLSTER, S. et HENREKSON M. (1999). *Growth effects of government expenditure and taxation in rich countries*. European Economic Review 45 (2001).
- GHALI K. H. (1998): *Causal dynamics of public and private investment: a study relating to Tunisia, 1963-1993*. revue des sciences juridiques, économiques et de gestion de Sousse, Voll, n°1, Juin.
- GHURA D., HADJIMICHAEL M. (1996) *Growth in Sub-Saharan Africa*, IMF Staff Papers, 43 (3), 1996.
- GREENE, J., and VILLANUEVA, D. (1991): 'Private Investment in Developing Countries', IMF Staff Papers, 38(1), pp. 33-58.
- HARROD, R.F. (1948), *Towards a Dynamic Economics: Some Recent Developments of Economic Theory and their Application to Policy*, Macmillan, Londres.
- HEITGER, B. (2001). *The Scope of Government and Its Impact on Economic Growth in OECD Countries*, Kiel Working Paper No. 103, Kiel.
- HERRERA, R. (1996), *Dépenses publiques et croissance de long terme: Approches théoriques et empiriques appliquées à l'économie du développement*, Thèse de Doctorat, Université de Paris I Panthéon-Sorbonne, Paris.
- HIRSCHMAN, A.O. (1958), *The Strategy of Economic Development*, Yale University Press, New Haven.
- HULTEN, C.R. (1996), *Infrastructure Capital and Economic Growth: How Well You Use It May Be More Important Than How Much You Have*, NBER Working Paper, N°5847.
- HULTEN, C.R. et R.M. SCHWAB (1991), *Is There Too Little Public Capital? Infrastructure and Economic Growth*, Discussion Paper, American Enterprise Institute, février.
- ISLAM R. et WETZEL D. (1991) *Macroeconomics of Public Sector Deficits : The Case of Ghana*, World Bank Policy Research Working paper 672.

35. JACQUET P. et CHARNOZ O. (2003), *Infrastructures, croissance et réduction de la pauvreté*, Agence française de développement (ADF. Paris)
36. KHAN, M.S. et M.S. KUMAR (1997), *Public and Private Investment and the Growth Process in Developing Countries*, Oxford Bulletin of Economics and Statistics, Vol. 59, pp. 69-88.
37. KEYNES J.M. (1936). *Théorie générale de l'emploi, de l'intérêt et de la monnaie*. PBP, Paris.
38. KOCHERLAKOTA, N. et K.M. YI (1996), *A Simple Model of Endogenous vs Exogenous Growth Model: An Application to the United-States*, The Review of Economics and Statistics, pp.126-134.
39. LEE, J-W. (1995). *Capital goods imports and long-run growth*. Journal of Development Economics, Vol. 48, 91-110.
40. MUNNELL, A.H. (1990a), *Why Has Productivity Growth Declined? Productivity and Public Investment*, New England Economic Review, Federal Reserve Bank of Boston, pp. 2-22, janvier-février.
41. MUNNELL, A.H. (1992) *Policy Watch: Infrastructure Investment and Economic Growth*, Journal of Economic Perspectives, Vol.6, N°.4, pp.189-198.
42. NUBUKPO K.K. (2003). *Dépenses publiques et croissance des économies de l'UEMOA*. CIRAD, Montpellier.
43. NURKSE, R. (1952), *Some International Aspects of the Problem of Economic Development*, American Economic Review, Vol. 42, mai.
44. OJO O., OSHIKOYA T. (1995). *Determinants of Long Term Growth : Some African Results*, Journal of African Economies, 4 (2), 1995, PP.163-191.
45. OTTO, G. et G. VOSS (1996), *Public Capital and Private Production in Australia* Southern Journal of Economics, pp.723-738.
46. RAJKUMAR A., SWAROOP V. (2002) *Public Spending and Outcomes : Does Governance Matter ?*, World Bank Development Research Group, Working Paper N°2840, Mai 2002, 30P.
47. ROSENSTEIN-RODAN, P.N. (1943), *Industrialisation of Eastern and South Eastern Europe*, Economic Journal, Vol. 53, juin-septembre.
48. SHAH, A. (1992), *Dynamics of Public Infrastructure, Industrial Productivity and Profitability*, Review of Economics and Statistics, Vol. 74, pp. 28-36.
49. STURM, J.E. et J. DE HAAN (1994), *Is Public Expenditure Really Productive? New Evidence for the U.S. and the Netherlands*, CCSO Series, N°. 20, University of Groninger.
50. TATOM, J.A. (1991), *Public Capital and Private Sector Performance*, Federal Reserve Bank of St. Louis Review, pp. 3-15, mai-juin.
51. TATOM, J.A. (1993a), *Is An Infrastructure Crisis Lowering the Nation's Productivity?*, Federal Reserve Bank of St. Louis Review, pp. 3-21, novembre-décembre.
52. TATOM, J.A. (1993b), *The Spurious Effect of Public capital Formation on Private Sector Productivity*, Policy Studies Journal, Vol.21, N°.2, pp. 391-395.
53. TENOU K. (1999) *Les déterminants de la croissance à long terme dans les pays de l'UEMOA*, Notes d'Information et Statistiques, Etudes et Recherches, N°493, BCEAO, Juin 1999.
54. VEGANZONES, M.A (2000), *Infrastructures, investissement et croissance : un bilan de dix années de recherches*, CERDI, Clermont Ferrand