**International Journal of Economics, Commerce and Management**
United Kingdom Vol. III, Issue 4, April 2015
*http://ijecm.co.uk/* ISSN 2348 0386

# ENTREPRENEURIAL INNOVATION AND CO-ORDINATION FAILURE: AN APPLICATION OF A BIG PUSH MODEL TO NIGERIAN ECONOMY

**Kadiri Kayode**
School of Management Science National, Open University Of Nigerian, Nigeria
Kaykad0809@Gmail.Com

**Genevieve Kelikume**
Center For Lifelong Learning National, Open University Of Nigeria, Nigeria
Genevievekelikume@Yahoo.Com

**Atoyebi Kehinde Olusegun**
Lagos State University, Department Of Economics, Faculty of Social Sciences, Nigeria
Kehindeatoyebi24@Gmail.Com

**Abstract**

*This study critically examines the interconnectivity between entrepreneur innovation and co-ordination failure in Nigeria. This study follows the standard assumption of the big-push model by developing a model that analyses the causes of co-ordination failure as well as the government failure. This study observes that as a result of the structure of Nigeria economy presently, state intervention in the establishment of state owned enterprises should be reduced to enhance entrepreneur participation in employment generation and productivity improvement because of the rent seeking behaviour by a particular interest group who may disallowing successfulness of government policy. Though, the big-push policy is needed to pave way for industrialization.*

*Keywords: Entrepreneurs innovation, co-ordination failure, big push, state owned enterprises.*

## INTRODUCTION

Entrepreneur's innovation according to Schumpeter (1928,1939) is a perpetual gales of creative destruction which serves as the driving forces of growth rates in a capitalist system. Schumpeter is was not a technological determinist but recognized the social and organization forces that played the key role in his cyclical process of industrial change. He was able to analyse the importance and the role of technological innovation in timing economic cycles but did not address its source. Not until 1970s when the economy were preoccupied with the search for the source of innovation.

Notable among the researcher who highlighted the importance of innovation are Abramowitz (1956) and Solow (1957). Another notable researcher is freeman (1982) who defined innovation of an entrepreneur as a method that use knowledge based in science or craft to create a new product or process. But the empirical study of Schmookler (1966) on chronology of inventions in major industries was driven by market demand as a stimulus for invention. His study provide a theoretical justification of a market pull model where innovation was based on the demand of the market.

But on the other hand, co-ordination failure is a situation in which agent's inability to co-ordinate their behaviour leads to an outcome that leaves all agent worse off than in an alternative situation that is also an equilibrium. Co-ordination failure also occurred according to Paul Rosenstein- Rodan when a firm or an entrepreneur is deciding to invest in new technology and faces a production function in the modern sector that requires some labour employment before initiating production point. The existence of complimentary among firms, worker organization or government increase the incentives for other agent to take similar actions. These complementariness involve investments whose returns depends on other investment being made by other agents. In development economics, such network effects are frequent, unstable among these complementariness are the big-push in which production design by modern sector firms are mutually reinforcing and the o-ring model, in which the value of skills or quality depends on similar upgrading by other agents.

Against this background, this study intends to examine critically the source of co-ordination failure as a result of entrepreneur decision to invest. The remainder of the paper is structured as follows. Section two outlines the theoretical model. Section 3 analyses the application of big push model to Nigeria economy in the absence of government intervention i.e. market failure as well as analysing the big push model in the presence of government intervention.

## THEORETICAL MODEL

A big push to industrialization requires a set of leading firms to invest in productive activities and transfer of modern technology and investment decisions made by modern-sector firms are mutually reinforcing and public policy intervention is needed to correct market failure.

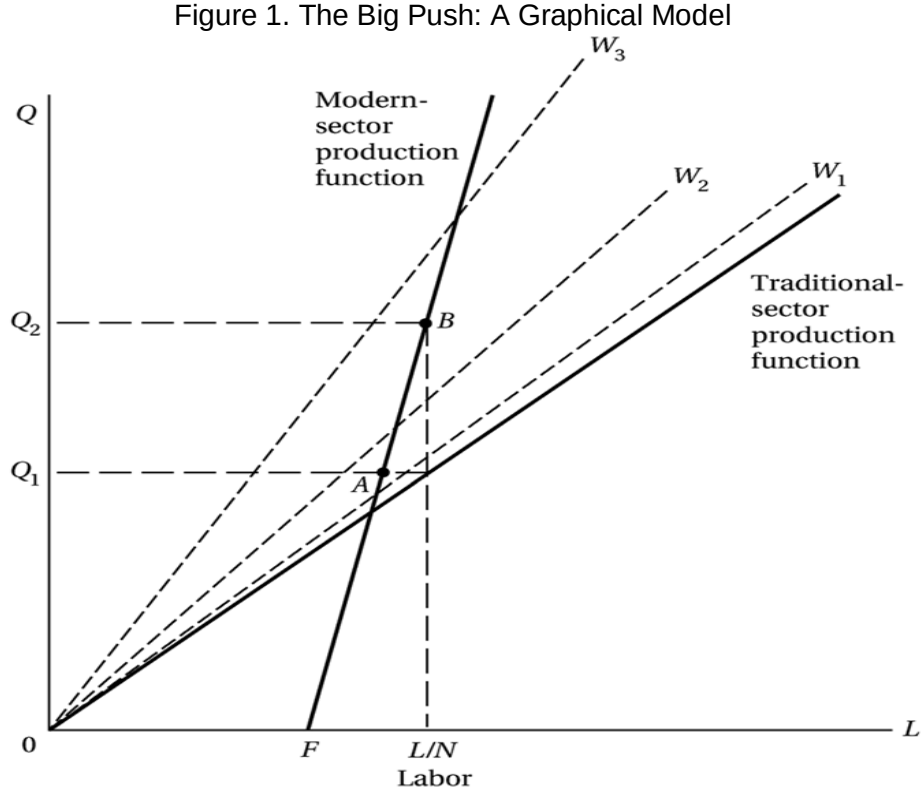
### Assumptions of Big Push Theory

- One factor of production: labor
- Two economic sectors: traditional vs. modern
- Same production function for each sector
- Consumers spend an equal amount on each product they buy
- Closed economy
- Perfect competition

### A Big Push: Coordination Failure

- A firm is deciding to invest in new technology
- It faces a production function in the traditional sector that passes through the origin as output increases with labor employment.
- It faces a production function in the modern sector that requires some labor employment before initiating production (point F).

Figure 1. The Big Push: A Graphical Model



- At a low wage rate like $W_1$, a new firm will enter the modern sector after paying the fixed labor cost (F). With high demand (Q2), the firm makes profit and invests in modern technology.
- As $W_2 > W_1$, other firms enter the modern sector to share the profit. Coordination between these firms is now needed for the economy to adopt modern technology.
- At $W_2$, investment becomes profitable if all firms invest in modern technology to industrialize the economy. High demand for manufactured products makes workers and firms benefit from capital investment.
- At a high wage like $W_3$, investment in modern technology is not profitable.

Point A is a stable equilibrium as low profits discourage firms to invest in modern technology (no industrialization).

Point B is an unstable equilibrium because it requires the principal to provide incentive to invest and agents to coordinate their decision of investment in modern technology (industrialization).

**Conditions Necessary for the Application of Big Push Theory**

- **Intertemporal effects:** Investment in the modern sector becomes profitable over-time as the market size increases.
- **Urbanization effects:** Demand for manufactured goods increases with urban population growth.
- **Infrastructural effects:** Improvement in transportation, communication, and distribution systems reduces the cost of investment.
- **Training effects**: The labor force becomes more productive and skilled with education.

**Kremer`S O-Ring Theory of Economic Development**

Another innovative and influential theory that provides important insights into low-level equilibrium traps was provided by Michael Kremer. The notion is that modern production (especially in contrast to traditional crafts production) requires that many activities be done well together in order for any of them to amount to high value. This is a form of strong complementarily and is a natural way of thinking about specialization and the division of labour, which along with economies of scale is another hallmark of developed economies in general and industrial production in particular. The O-ring theory is interesting in part because it explains not only the existence of poverty traps but also the reasons that countries caught in such traps might have such exceptionally low incomes compared with high –income countries.

### *The O-Ring Model*

The key feature of the O-ring model is the way it models production with strong complementaries among inputs. We start by thinking of the model as describing what is going on inside a firm, but as we will see, this model also provides valuable insights into the impacts of complimentaries across firms or sectors of the economy. Implications of strong complementarities for economic development and the distribution of income across countries will induce countries at the same level of development to coordinate their actions.

### *IMPLICATIONS OF O-RING THEORY*

The analysis has several important implications:

- Firms tend to employ workers with similar skills for their several tasks.
- Workers performing the same task earn higher wages in a high-skill firm than in a low-firm.
- If workers can improve their skill level and make such investments, and if it is in their interest to do so, they will consider the level of human capital investments made by other workers as a component of their own decision about how much skill to acquire.

### The Hausmann-Rodrik-Velasco (Hrv) Growth Diagnostics Framework

This theory focuses on a country's most binding constraints of economic development: low rate of return on investment and high cost of financing investment. Insufficient investment in physical, social, environmental, and human capital.

The authors noted that there is uncertainty about what products a country can produce efficiently; there is need for local adaptation of imported technology. They also encourage efficient investment and emphasized that widespread entrepreneurship plays a prominent role in accelerating growth and promoting development more broadly. According to them the key mission for economic development specialists is to help determine the nature of the constraints for each country.

### The Theory of Balanced Growth

The Theory of Balanced Growth by Ragnar Nurkse highlight the Increase in the amount of capital utilized in a wide range of industries if industrialization has a chance of being achieved (like Rossenstein-Rodan emphasized) and massive injection of new technology, new machines, and new production processes spread across a broad range of industrial sectors.

In less-developed nations, small incremental increases in capital formation would not solve the problem because an individual business or a single industry alone attempted to raise

its output and risk of not finding a market for its product because of the low level of overall average income (similar to Rosenstein-Rodan). Solution: So he emphasized that large-scale increases in supply across a large number of industrial sectors would at the same time, be met by a large-scale increase in demand created by the same expansion. This income would be transposed into a further expansion of demand by other firms and by workers in those firms buying the increased array of domestic goods available.

Conclusively, Nurkse advocated forced savings through an increase in taxes on upper-income recipients. The increased investment funds generated could be allocated to the most promising industrial sectors via government-operated development banks designed to identify and promote industrialization in the private sector or via private sector banks. This leads to an increase in the supply of available domestic output via enhanced capital formation. A market for domestically produced goods would be created because potentially competing imports would be deflected via tariffs to the purchase of lower-priced domestically produced goods known as "Import substitution industrialization".

**Unbalanced Growth**

Unbalanced Growth by Albert O. Hirschman. Hirschman's work was to be interpreted as an attack on the theory of big-push or balanced growth. He supported an "industrialization" and believed that the key to rapid industrialization was to be found in large-scale capital formation in several industries and sectors but he advocated the unbalancing of the economy, creating disequilibrium situations, for 2 (two) reasons. There were resource limits in the less-developed regions and that this would necessitate prioritizing some areas of industry over others for the use of limited investment funds. Then, it's impossible to move investment in all industries at the same time as was envisioned in the big-push and balanced growth theories.

So, the pressure from unbalancing the economy and in creating excess capacity in some areas and intensifying shortages in other areas results in subsequent reactions speed the development process by opening up opportunities for profit for new entrepreneurs.

Also, unbalanced growth by Albert O. Hirschman envisioned Backward and forward linkages . These were important in evaluating where to locate the initial investment. So that development strategies could be built around the maximization of the estimated stimulus of promoted industries in generating domestic backward and forward linkages. Backward linkages: When one industry expands, it requires inputs from other industries to be able to produce. Forward linkages: When an industry sells and transports its production to other firms and sectors in the economy. The production of one firm in one industry has a multiplicity of backward and forward linkages with firms in other industries.

## ANALYSIS OF THE MODEL TO NIGERIA ECONOMY

### Co-ordinature failure or market failure in the absence of government intervention

The assumptions of the model are as follows:- standard assumption in big push models in which the economy is assumed to be closed with only traditional production. Secondly, the model assumes that the traditional sector workers receive a wage given by the value of their marginal product. And, as result normalizing the supply price from the traditional sector to unity, the traditional wage is $W^{crs} = 1$ where w is the wage and crs is the constant return to scale to technology (Dasetal, 2007).

The model illustrates that when an entrepreneur is making an investment decision, he takes the income level as given in the economy. It then mean that he does not internalize his own investment decision on aggregate income and also he does not internalise his investment decisions of others entrepreneurs. The implication of this is that he would be facing two set of profits namely perceived profits and the realized profits which will serve as a source of inefficiency in the investment choices.

Since in a traditional economy setting:

$Y_o = 1$ then, perceived profits can be written inform of

$$\pi Pro = \frac{(\beta - W)}{\beta} - wg \quad - \quad - \quad - \quad (1)$$

Where $\pi$ is the perceived profits of the entrepreneurs, β refer to the productivity mark up in the traditional sector. g is assumed to be a proxy for the level of development determined by the quality of research and development.

Suppose the investment at an initial stage seems to be unprofitable, then the equation can be expressed as:

$$\pi Pro < O \Rightarrow g > \frac{\beta - W}{\beta W} \quad - \quad - \quad - \quad (2)$$

If the inequality constraint above holds, it justifies a necessary condition for improving government intervention. Secondly, if we assume that government in our economy played an active role through intervention each private firm will be profitable then, an equilibrium profit will be given as:

$$\pi = \beta (l - g) - w \quad - \quad - \quad - \quad - \quad (3)$$

Where y is the aggregate income in the economy. As a result of co-ordination failure in the economy, the economy is caught in a low income trap.

Given an income identity $y = w + \pi P$ where; y gives total income. When inserted equation (3) in y income identity it yields $y = \beta (l - g)$ - - - (4)

And, $y \pi P_1 > 0$ which implies that

$g < \frac{\beta - W}{\beta}$ and when combine equation (2) and equation (4)

We can infer that co-ordination failure assumption is based on the following condition.

$\frac{\beta - W}{\beta} < g < \frac{\beta - W}{\beta}$ - - - - (5)

**Co-ordinature failure or market failure in the presence of government intervention**

In the second scenario, with the presence of state intervention, it is assumed that fixed costs in modern production are to be sufficiently large to allow at least one domestic producer of a manufactured goods. Therefore, the modern sector profits is given as:

$\pi r = y \frac{(\beta - W)}{\beta} - wgi$ - - - - (6)

The state intervention is inform of establishing a state own enterprises. They are inherently inefficient because they are not profit oriented. In Nigeria for instance, over staffing among SOEs is very common. Also, government always face pressure of job creation and this may lead to excessive intervention due to lack of autonomy.

In summary, since there is a zero profit condition $\pi p = 0$

Then $g_o = y \frac{(\beta - W)}{\beta w}$ - - - - - (7)

And for $g_o < g_1$ the gap between the fixed costs necessary to start up modern production and the level of fixed costs that would ensure breakeven.

$W(g - g_o)$ will be covered by subsidies upon the availability of government funding. It can be infer that the establishment of state ownership enterprises increases in income in a traditional economy. This can be evidently proved below that if for $g_o \leq g$

$\beta \frac{(\beta(l - g)}{} - 1$ - - - - - (8)

$((\beta - n)(\beta - 1))^2$ Since $w > 1$ where $w$ is the wage markup $(w-1)$ for all workers employed by n SOEs namely n by $I^{irs}$ for $g_o \leq g$ the minimum administrative requirement g is binding. And also transfer is necessary to all SOEs to break even. Aggregate income increase in case of government intervention despite inefficiency of the policy intervention. In addition the critical number of SOEs to induce private investment is given by $\pi_p(n) = 0$ resulting in

$$n = \frac{w(g\beta + 1) - \beta}{g\beta\,(w - 1)} = n^*$$

Where n* defines the minimum effort required to induce private investment in modern technology manufacturing and that the critical push required to trigger the economy to a high equilibrium income is larger in Nigeria.

## CONCLUSION

The paper critically examine the link between entrepreneurs innovation and co-ordination failure with particular reference to Nigeria economy. This study observes the existence of co-ordination failure or market failure along side with government failure. We observed that co-ordination failure arises because of complementariness of the modern sectors i.e. state owned enterprises crowding out private investment. We also observed that policy inefficiency of state intervention was as a result of undeveloped institutional environment because such policies are often hijack by interest groups which always lead to rent seeking (see Bjorvtan and Coniglio 2006). Lastly, one can conclude that as a result of malfunctioning of the market. Therefore trade off exist between the co-ordination failure and government failure and this is due to the structure of Nigeria economy at present, therefore, there should be a reduction in the level of state intervention to trigger private entrepreneurs to participate fully in employment generation and so also increase total factor productivity of the economy.

## RECOMMENDATIONS

- Foreign direct investment (FDI) is arguably an important source of employment opportunities for developing countries like Nigeria. It is, therefore imperative that a healthy private sector that can earn a reasonable rate of return is promoted by the Federal Government.
- Nigeria that wish to attract FDI flows should consider measures such as establishing a transparent legal framework that does not discriminate between local and foreign investors; adopting liberal foreign exchange regime (e.g., among, other things a regime without large gaps between official and market rates); creating simple, investor-friendly regulations and institutions and effectively administering them.

## REFERENCES

Chang. H.J. 2007. State-owned. Enterprises Reform, United Nations Department of Economic and Social Affairs (UNDESA). National Development Strategies: Policy Notes, United Nations.

Da Rin, M., Hellmann, T., 2002. Banks as a catalysts for industrialization. J. Finan. Intermediation 11, 366-397.

Das, S., Roberts, M.M. Tybout, J.R., 2007. Market entry costs, producer heterogeneity, and export dynamics. Econometrica 75 (3), 837 – 873.

Gans, J.S., 1998. Industrialization policy and the big push. In: Arrow. K.J. et al. (Eds.), increasing Returns and Economic Analysis Macmillan, London,, Chapter 13.

Gore, C., 2000. The rise and fall of Washington consensus as a paradigm for developing countries. World Devel. 28 (5), 789 – 804.

Greenwald, B., Stiglitz, J., 2006. Helping infant economies grow: foundation of trade policies for developing countries. Amer. Eco. Rev. 96 (2), 141 – 146.

Grossman, P., 1988. Government and economic growth: a non-linear relationship. Public Choice 56, 193 – 200.

Gwartney, J.D., Lawson, R., 2009. Economic Freedom of the World: 2009 Annual Report, Economic Freedom Network. <www.fraserinstitute.org and www.freetheworld.com>

Kohli, A., 2004. State-Directed Development. Political Power and Industrialization in the Global Periphery. Cambridge University Press.

Murphy. K.M., Shleifer A., Vishny, R., 1989. Industrialization and the big push. J.Polit. Economy 97, 1003 – 1026.

Pack. H., Saggi, K., 2006. The case for industrial policy: a critical survey. World Bank Res. Observer 21(2), 267-297.

Poot, J., 2000. A synthesis of empirical research on the impact of government on long-run growth. Growth change 31 (fall 2000). 516-546.

Rodrik, D., 1995. Getting intervention right: How South Korea and Talwan grew rich. Econ. Pol. 20, 55-107.