



ORIGINAL RESEARCH ARTICLE

Globalization and the Implications for Trade-Readiness of Small Developing countries: a Case Study of Trinidad & Tobago

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Abstract: *This paper uses the model of the new growth theory to evaluate whether or not Trinidad and Tobago can develop a sustainable path of development in the non-oil sectors that would lead to increased trade with the rest of the world. It is proposed that Trinidad and Tobago's manufacturing sectors may be able to flourish in the global economy if it is able to make use of the technology presently available globally, as well as create and sustain some degree of knowledge creation. A review of the literature shows that developing countries like Trinidad and Tobago can exist and participate in the global economic arena, if they adopt the philosophies and practices that have been advanced by the new growth theories, specifically the endogenous growth theory. This paper postulates that economic growth can be attained if there is sufficient levels of research and development (R&D) applied to the productive process, and this needs to be expressed not only at the level of the firm, but throughout the economy as a whole.*

Keywords: Endogenous growth theory, international trade, developing states, globalization

INTRODUCTION

The Caribbean region, like many other small developing states, is under pressure or survival from globalization. While some small states have become more incorporated into the world economy, this has not been the case in our context, and as a result, and it is being argued that our ability to interact meaningfully with the world economy has not significantly improved.

We are seeing the broadening and deepening of certain phenomenon such as the building and strengthening of regional and hemispheric trading blocs; into which we now have to be incorporated; oftentimes neither from desire nor foresight; but from necessity and survival.

To do this effectively, the levels of productivity by necessity must increase. This position should be predicted on the realities of competitiveness, efficiency, innovation and aggressive niche marketing.

Trinidad and Tobago needs to develop its innovative capacity and this paper argues that this can be done though the development of the national innovation system. Endogenous Growth Theory lends some insightful ideas and perspectives that need to be evaluated; and that can assist in developing a framework for the prescribed policies in critical areas such as Research and Development, innovation policies, training, learning-by-doing and the like. The time is coming when Trinidad and Tobago will no longer be able to sustain its economy using the present developmental paradigms; and as such the move to the new approach to sustainable innovative development is critical.

We will address the competitive and development challenges facing the twin island republic and in the discourse, find a new way of looking towards the future that will assist in the real and sustainable development of the Trinidad and Tobago economy. This will include the development of an endogenous growth model that will allow for sustainable innovation and ultimately, sustainable development; dependant on the national innovation systems that need to be developed.

METHODOLOGY

As an academic endeavor we will begin with a review of literature as it relates to the growth and development of competitive capacities in developing countries. After a wide reading of the

literature and the relevant growth theories, it seems clear to the author that the Endogenous Growth Theory has the most to offer in terms of its intellectual underpinnings and its practical applicability in Trinidad and Tobago. This theory has the advantage of being able to add to the research endeavor of this paper and assist the relevant approaches to development, innovation creation, research and development policies and the like.

One needs to look at the process of globalization and see how it is affecting the development of Trinidad and Tobago and the region, looking at the competitiveness, Endogenous Innovation Systems and government initiatives, technology factors in industrialization theories relating to Trinidad and Tobago.

CHALLENGES OF GLOBALIZATION AND COMPETITIVENESS OF SMALL DEVELOPING STATES

The Organization for Economic Co-operation and Development (OECD) defines competitiveness as, "the degree to which a nation can, under free trade and fair market conditions, produce goods and services, which meet the test of international markets, while simultaneously maintaining and expanding the real incomes of its people over the long-term." (OECD, 2001)

National competitiveness has been at the heart of much debate by the governmental bodies and firms in both developed and developing countries alike. This fact does not only reflect the country's natural endowments, labour pool, interest rates, macro and micro economic policies or its currency's value, as classical economics insists. Regardless of size or resources, a nation's competitiveness depends on the capacity of its industry to innovate and upgrade (Porter 1990). For the purpose of analysis in this paper we will consider competitiveness to be the degree to which a firm is able to increase its efficiency and as a result; increase its dominance in absolute terms and in terms of market share. We are concerned with the firm level of analysis while underscoring the significance of other levels of analysis, namely the macro which will include the government and its policies. For this to take place the firm needs to maintain its dedication to constant innovation and improvement, and unlike traditional economics, it must consider these costs to be a standard cost of production.

It is a generally accepted principle of modern trade theory that firms gain competitive advantage against the world's best competitors because of the pressures and challenges dictated by

the marketplace to constantly innovate and become more efficient.

Michael Porter (1990) in 'The Competitive Advantage of Nations' advocates that firms benefit when there are a number of local conditions exist, and these include having strong domestic rivals, aggressive home-based suppliers, and demanding local customers. While this paper does not discount the findings of Porter, is in more specifically concerned with the role of the new growth theories to small economies like Trinidad and Tobago. While it acknowledges the assumptions and finding of the Porter thesis, it assumes that these small economies will be better served by trying to implement the recommendation so the new growth theories, that trying to create the conditions suggested by Porter, which relate to more industrial and advanced economies.

In order to be truly globally competitive, the demands of an economy must integrate the generation of fresh ideas, identification of opportunities and is responsive to the changing conditions of global markets. This is supported by the theories of the Endogenous Growth Theorists (Grossman and Helpman, 1994) who similarly advocate that a firm can only really become more competitive by increasing the level of innovation of its goods and service above that of its competitors. It is clear to these theorists that there would be no scope for increased competitiveness among firms in the industry if there is not serious dedication to innovation processes as a function of research and development.

Note must be taken that "the endogenous growth framework offers no insight into what role, if any, entrepreneurship activity play..." (Acs et al, 2009). So while we speak to innovation and productivity these authors see the need to incorporate the specific variable of entrepreneurship into the equation, if new growth theories are to be more relevant. In this article they postulate that this factor needs to be taken into consideration as entrepreneurship activities can waver depending on the levels of governmental intervention into the economy, amount of regulation and the administrative burden to be undertaken by the firms.

Competitiveness must not be seen as an absolute factor; instead it should be regarded as a relative one, as one's level of competitiveness is measurable by comparing it to another. Thus, in order to accurately measure this phenomenon, one has to track the inputs of Research and Development, innovation policies, training and other related activities by the firm.

In innovative industries, firms compete primarily by introducing new products and processes, they may follow various

strategies that include seeking to innovate (they may imitate products and processes brought in by innovating firms); or they may continue with older products and processes and seek other advantages (to compensate for their technological disadvantages), like lower material costs, or lower real wages.

We posit here that the firm's ability to be competitive and indeed to use technology and innovative processes; requires it to accumulate the appropriate technological capability internally. The issue of competitiveness is paramount when dealing with the issue of survival in the global economy; particularly for the small developing economies like Trinidad and Tobago. Additionally, it is being suggested that entrepreneurship activities will be greater where there exists already large investments in new knowledge creation since it is presumed that start-up firms will be able to exploit the knowledge (spillovers) that are present in the market.

Competitiveness Policy, regardless of the sector to which it is applied, will drive the innovative process at the firm and national levels. This implies that once the move towards innovation is accepted in the economy, the spillover effects will be significant. This move to greater levels of innovation may indeed "...produce new insights into the role of innovation activities such as R&D, new production development and interfirm alliances during the early life course of firms..." (Stam and Wennberg, 2009). In other words, R&D efforts will essentially allow for the exploitation of external knowledge that already exists in the market, and as such, the local Trinidad and Tobago firms will better be able to capitalize on these factors if they increase their levels of local R&D.

Advances can also be made with the targeted increase in human capital development in the local economy, as has been espoused by Fogel (2009) when looking at the development of Asian economies, sighting growth rates in China in the 1980s and India in the 1990s. He asserts that, "... the marginal productivity of physical capital has risen, not only because of the advanced technology embodied in new physical investment, but also because of the greater investment in raising the quality of labour" (Fogel, 2009).

This will necessarily require change management, endogenous innovation and competitive advantage building, all of which are essential elements for the increase in exportability. Trinidad and Tobago no longer enjoys the luxury of protected markets for its exports, and as such is required to treat innovation and research

and development as key ingredients in the competitiveness formula that is necessary for survival.

The Cold War has ended and the degree of freedom that was once afforded the Caribbean region in relation to its independent development strategies has been eroded; not to mention the imminent erosion of preferential trading arrangements with the region's largest trading partners, as is evidenced by the latest round of trade negotiations and the insistence of the EU that we are becoming more irrelevant in terms of international and hemispheric trade, and as such will only be considered or recognized as part of a larger contrived regional group (Cariforum), (CRNM, 2006). This is because the world is changing and the way that trade is conducted has changed radically since the 1960s. There are increased efforts at regional and bi-lateral trading arrangements, the loss of preferential treatment for the majority of traditional exports of the region, as well as the fall in the price of these exports as well as the increasing availability of substitutes globally.

Competitiveness then can be further modified to specifically deal with a country's ability to continuously position itself in an advantageous position relative to others on a series of criteria that will include taxation and regulation; economic and technological infrastructure; education and training; innovation and Research and Development; and entrepreneurship.

THE HISTORICAL EVOLUTION OF ECONOMIC DEVELOPMENT POLICY FOR TRINIDAD AND TOBAGO

Development of the past was considered largely synonymous with industrialization, the standards of living of the people and concomitantly raising the income of the nation, while giving the population access to a range of goods and services that were already available in the developed countries.

Industrialization was thought to be the best and most efficient means of attaining these development goals, as is reflected in the policies adopted, informed by Arthur Lewis' 'Industrialization by Invitation' that was based on Puerto Rican model of industrialization in the 1940s; and the Import Substitution Industrialization strategies undertaken in the 1950s, 1960s and 1970s which sought to modify the Ricardian model of comparative advantage.

By the 1970s the shortcoming of the state-led approach in development strategies had become all too apparent, especially after the 'post war' boom had begun to wane and economic hardships were being felt internationally. Also the issue of sovereignty became paramount in the international area, particularly for the small developing countries.

To be sure, the developmental policies of the 1970s and 1960s reflected the thinking of the time with structuralism and socialist-oriented policies that called for governmental intervention in the economies. The 1980s saw a move away from this perspective, and neo-liberalism became the preferred paradigm of the day; as such we saw the emergence of International Monetary Fund (IMF) and the World Bank (WB) having policy shifts. This was represented by the Structural Adjustment Programs of the IMF.

By the end of the 1980s the majority of developing countries had voiced their utter dissatisfaction with the multi-lateral organizations that had purported to be their managers and protectors in the different realms of international political economy. Specific allegations were lead against the WTO and the IMF. It was advanced that the policies of these institutions served to further marginalize the developing countries.

To this end, developing countries resisted trade negotiations that seemed to exclude their particular and peculiar concerns. They were no long prepared to simply 'show-up' at different rounds of negotiations being unprepared and underrepresented; they now had enough and were poised to flex their collective muscles. They sought to do so for the first time in the Doha rounds (Lomé, and Cotonou).

By 1989 with the fall of the former Soviet Union, there was a consolidated position of the neo-liberalist paradigm within the international system. It has been argued that by 1990 the world, inclusive of small developing economies like Trinidad and Tobago, was embracing the concept of globalization and neo-liberalism. This cemented the capitalist paradigm in the international system and placed the developing countries and the Caribbean region firmly in its position in the international division of labour.

Developing economies are different from developed countries and our realities are clearly more challenging, and obstacles more insurmountable. One of the major ways in which we as less developed countries are separated from the more developed countries is by the level of endogenous knowledge. This knowledge divide is amplified and exacerbated by the gap in ICTs, Research

and Development and Innovation initiatives. In order for there to be some degree of progress and 'development' we need to concentrate on more than simply closing the gap in physical or even human capital, but also closing the gap in knowledge.

It is not simply the knowledge of production processes that matter, but for successful development there needs to be the creation of institutions and policies implemented to assist in this goal. One main feature of good institutions and policies is that they not only facilitate the efficient transfer of knowledge, but also enhance the likelihood that such knowledge will be used effectively in the production of products.

We also need to realize that imperfections of information impede the workings of both the local and international markets. As mentioned earlier, the traditional economic models assumed that perfect information may not provide a good approximation for understanding the factors of production, namely land, labor, product, and capital markets.

Trinidad and Tobago has always relied on modernization models that have not been able to realize its full competitive potential. It has used the economic theories of the North without adapting them properly to the unique conditions and circumstances. It is being argued here, that if this is done along with some economic analytic research, one would come to the conclusion that there are lessons to be learned from the last 50 years of economic development in the region; both at the state and regional levels.

Some of the assumptions of comparative advantage that we have employed in our theoretical thinking, developmental strategies and governmental policies may be viewed as questionable. Even today we know that the four pillars of the economy (land, labour, capital and enterprise) are constantly changing. As a result of the *ceteris paribus* assumption, we find ourselves going down the wrong road to development, making policies that are based on faulty economic assumptions.

In light of this one has to realize that the development paradigm of the history books is no longer applicable to small economies, and as a result, does not provide the proverbial 'road map' to development; especially in this era of excessive liberalization and expanding globalization.

The wisdom of the economic history books urged the protectionist argument which held that declining industries should to be protected (against the vagaries of the world market), since

trading conditions encourage the re-allocation of resources away from those sectors in which the country once had a comparative advantage. These theories hold lessons to be learnt for small developing countries like Trinidad and Tobago, and should not be used as models of development in this new dispensation. The policymakers need to chart a new path forward with the knowledge that has arisen from the literature and the lessons of the Newly Industrialized Countries.

By understanding the new growth theory, Trinidad and Tobago needs not be simply relegated to the mere production of raw materials for the export to metropolitan countries, but has the ability to find niche markets in goods and services that have high technology inputs, and indeed may even be able to develop competitive advantages in areas of research and development. The issues has been compounded in Trinidad and Tobago, as it has been inflicted with the 'Dutch Disease' of depending too heavily on its deposits of fossil fuels (oil and natural gas).

The new growth theories highlight that the new specialization the country seeks brings with it unseen advantages such as economies of scale (reducing costs of production and increasing comparative advantage); and learning by doing, again reducing costs of production and increasing comparative advantage. This of course has to be juxtaposed to the arguments that infant industries (those seeking to grow and expand) should be protected to encourage the development of economies of scale and technological improvement.

Through even a cursory glance at the literature, one understands that the logic espoused to justify trade restrictions, but the same economic proponents are now recognizing that these policies actually impede the true flow of international trade and hinder development globally (Stiglitz, 2002; Krugman 1992).

The conventional story of development in Trinidad and Tobago, as with the rest of the developing world, states that as growth occurs in the agricultural sector, (which is confronted with price and income inelasticity), it will tend to decline relative to the rest of the economy. One would expect to see the agricultural sector lose resources and investments that will ultimately be poured into other more lucrative sectors as incomes and opportunities grow in the rest of the economy. However, in the light of trying to diversify the economy, we need to revisit this logic.

Trade liberalization may offer some sort of refuge for the agricultural sector which has been ravaged by falling demand and prices and the associated economic hardships. It is argued that there may be a relative growth in the agricultural sector as trade opportunities are opened up and it becomes more efficient. In effect, the opening up of the economy encourages trade and thus the associated resource allocation to follow comparative advantage.

In simple terms, Trinidad and Tobago's comparative advantage depends on its resource endowments; and while it is benefiting from the export of oil and natural gas there is the possibility of increasing its production of goods and services in other areas (with increased value being added). It is being proposed that the economy should move away from policies directed at its comparative advantage, and seek for find refuge in the new competitive advantage theories.

The new knowledge revolution is based on modern science and technology, and the change in modes of thinking that modern science brings with it constitutes one of the major aspects of the development process that may be utilized in this small economy. Methods of enquiry must go beyond the old paradigms that have resulted in such questionable results in development attempts. Attention needs to be given not only to new knowledge, but also the new processes of knowledge-gathering and knowledge application.

Once one begins to question traditional beliefs in business choices and practices, governmental control and contribution to production, the value of R&D and innovation; change is inevitable. It has been successfully argued that the scientific process itself is one of constant change, and one idea leads to another, often challenging the previous one as new evidence overturns existing hypotheses and beliefs. Science and as a consequence, economics is constantly changing, and as such the assumptions that act as the foundations of policy are also changing.

In light of the market fluctuations, limited resources in Research & Development, training and innovation, and an immature entrepreneurial class, there needs to be some degree of governmental intervention by way of competitiveness incentives, infrastructural and technological assistance, statutory and regulatory changes, policy and policing changes in relation to new-era concepts like patents, licenses and the like.

By evaluating the models that exist in the world Trinidad and Tobago's economy need not be relegated to the mere production of raw materials for the export to metropolitan countries, but may have the ability to find niche markets in goods and services that have high technology inputs, and indeed may even be able to develop competitive advantages in areas of Research and Development. This is so, especially if it can foster policies that would address these possibilities instead of following the old models of primary extraction.

INTERNATIONAL TRADE AND TRADE POLICY IN CARICOM

It is a generally accepted principle that by specializing in the production of particular goods and services, firms within an economy would increase efficiency, and trade their surplus for goods and services from other economies. In other words, countries engage in international trade because this activity produces benefits for all the parties involved.

These gains may take the form of lower prices, more choice, more technology etc. The literature is inundated with studies that have linked the economic benefits of trade for countries, and increased trade openness has been linked to increased GDP growth. However it should be noted that there will necessarily be losers in the game, trade liberalization, while benefitting some economies, may indeed cause harm in others.

The economies that produce exportable goods will benefit from surpluses and high employment. The economies that see their goods replaced by low cost, high quality imports, will necessarily feel the negative effects of trade liberalization. The conundrum for Caribbean policymakers, inclusive of Trinidad and Tobago's, is in determining how to reduce losses to the economies as trade barriers have to be lowered, while at the same time encouraging the producers in the economy (often times with incentives) to make advantage of the prospects in the new global system.

Trade policy usually refers to the instruments that are available to governments to control imports and exports, and in the CARICOM (Caribbean Community) reality, to increase exports and reduce imports. Historically economies were armed with the tools of quotas and tariffs to protect local producers, (assisted by government subsidies) which were used with the intention of increasing the endogenous productive capacities, with the intention of making them efficient exporters.

With the changing times, and new international rules as they relate to trade liberalization, CARICOM is committed to the principles of free trade and the reduction in governments' direct involvement in production. These policies follow the liberal paradigm that assumes the less involved the government is in the economic decision, the more efficient the economy will become. Yet due to the economic realities of small size and resources, it is also recognized that the governments have a duty to protect its most vulnerable citizens and as such a degree of welfare economics is incorporated into the policies, domestic and foreign.

To increase trade-readiness, the region in general and Trinidad and Tobago specifically, has to engage the endogenous growth theory to be able to engage the international trading arena more meaningfully. This will necessitate an evaluation and reformulation of the innovation systems that presently exist as well as a possible re-direction of government policies.

UNDERSTANDING THE THEORY

At its most basic, endogenous growth refers to economic growth that occurs from within the system, usually identified as the nation state. It is clear to see that there have been a number of reasons for the growth of these theories/models and they include the fact that the economies and outputs from the industrialized world have increased exponentially over the last 100 years. This new theory "...tries instead to uncover the private and public sector choices that cause the rate of growth of the residual to vary across countries" (Romer, 1994).

Endogenous Growth Theory postulates that the rate of technological progress should not be taken as a given in a growth model, and that appropriate government policies can permanently raise a country's growth rate particularly if they lead to a higher level of competition in markets and a higher rate of innovation; which may in turn lead to the development of market niches for some products.

At the backbone of the theory, it is assumed that the investment in human capital (education and training) is an essential ingredient of growth. Additionally, it assumes that there are potential increasing returns from higher levels of capital investment made within the local economy, and as a consequence, emphasizes that private investment in Research & Development is the central source of technological progress. To be sure, the system

will work best if there are adequate systems put in place to protect intellectual property rights and patents that can provide incentives to engage in Research & Development.

Trade openness is recommended and it is postulated that in the long run, this openness is more beneficial to small economies than is trade protectionism (as has historically been the implied logic in development theories used by these small states).

Since the 1970s there were many aggregate models. The theorists in the 1970s assumed that there are many firms in the market and that they all had monopoly power together (Avinash Dixit and Joseph Stiglitz, 1977). New Growth Theorists, Gene Grossman and Elhanan Helpman (1989) advanced the theoretical argument by including monopolistic competition into their models. These theorists posited that it was indeed monopoly profits that fueled research and development and by extension, new discoveries. Research undertaken by Grossman and Helpman (1989, 1990) demonstrates that monopoly profits motivate innovation, and they have been able to show the relations between market size, international trade and growth. The New Growth theory relaxes the assumption of diminishing returns to capital. It does so with the new assumption of continuous Research & Development. With constant or increasing returns, the New Growth theory does not conclude that income per-capita will converge across the world economies (Helpman, 2004).

This New Growth Theory is most applicable and provides the framework for analyzing the issue of globalization, and trade-readiness of the Trinidad and Tobago economy.

The endogenous growth theory provides us with new insights in the causes and effects of technological change as a determinant of economic growth. Basically there are two identifiable types of technological change: an increase in the number of technologies on the one hand [Romer (1990), Grossman and Helpman (1991)] and the quality improvement of the existing technologies [Aghion and Howitt (1992), Grossman and Helpman (1991)] on the other. While both types are indeed important, this paper will restrict the analysis to the latter as a possible way of increasing the levels of competitiveness and exports in the local economy.

New Growth Theory aids in the analysis as it views technological progress as a product of economic activity, whereas previous theories treated technology as a given, or a product of market forces. It internalizes technology into a model that explains how markets function. Secondly, it postulates that unlike physical

objects, knowledge is characterized by increasing returns and these increasing returns are responsible for driving the process of growth. Thus main thrust of economic growth comes from knowledge and innovation (Romer 1990; Grossman and Helpman 1991).

Even small economies like Trinidad and Tobago can become more efficient and productive if it dedicates resources to the increase in the endogenous knowledge sector. As knowledge drives growth (as ideas can be shared indefinitely and can continuously add to the production function) it must be central to any economic activity. Technological innovation it is argued, it is the force that keeps the economy growing, and not as some believe, the new technologies themselves (suggesting that the process is more important to some extent than the actual product of those processes). This creates some space within the theory for small developing states to increase their share of world trade, assuming that the policies of the government are directed to increased trade-readiness and not pre-occupied with protectionism as tends to be the case.

It is being argued that the success of increased productivity and exportability is relative to the development of endogenous innovation systems and government policies.

ENDOGENOUS INNOVATION SYSTEMS AND GOVERNMENT INITIATIVES FOR TRADE-READINESS: TRINIDAD AND TOBAGO

Innovation systems are needed to advance any economy, and these systems are the combination of efforts from many quarters including the private sector, the public sector and non-governmental and non-enterprise actors like universities and academic and entrepreneurial think-tanks.

Although there are often subtle differences in definition, Niosi et al (1993) captures them by defining the National Innovation System as: “the system of interacting private and public firms (either large or small), universities and government agencies, aiming at the production of science and technology within national borders. Interaction among those units may be technical, commercial, legal, social and financial, in as much as the goal of the interaction is the development, protection, financing or regulation of new science and technology” (Niosi et al, 1993, 212).

The National Innovation System concept first emerged in the 1980s to explain the differences in innovative performances of

industrialized countries (Nelson, 1993; Lundvall, 1992; Freeman, 1995). These proponents argued that differences in economic and technological performance across national states were due to the combinations of institutions involved – and their interactions – which determined the processes of accumulation of capital and technology. In other words, variation in national innovative performance depended on “institutional differences in the mode of importing, improving, developing and diffusing new technologies, products and processes” (Freeman, 1995, 20).

Theorists (Nelson and Rosenberg, 1993) make a salient point when they argue that the notion of ‘national systems’ may be too broad as the system of institutions supporting technical innovation in any particular field may have very little overlap (if any) with those institutions supporting innovations in another. Similarly, it is important to note the difference between innovation systems and invention systems. One must remember that enterprise is a factor in the equation, to do otherwise would be to ignore the Schumpeterian assumptions. One of the central claims in Schumpeter’s “Theory of Economic Development” (Schumpeter, 1949) is that invention is not to be confused with innovation, that the latter is an economic act and indeed that innovation may depend not on new technology but on new perceptions of market opportunity. It is assumed that the successful entrepreneur (just as with the successful scientist) has formed a different view of the world and possesses the leadership and strength to carry the vision to fruition. If the individual firm or industry does not carry out this function, then maybe it is for the central economic manager (government) to create the environment to nurture this attitude.

As Schumpeter pointed out, the consequence is that the innovation process is highly uncertain and it threatens established positions and encourages those positions to resist the innovation process. In small economies like Trinidad and Tobago, this seems to be even more important, and local policymakers need to be aware of this fact and not fall into the ‘paradigmatic trap’ of old. They need to move beyond old modes of thinking and policy formulation into an era of creative and informed policy making for the development of the endogenous innovative capacities that can flourish.

In Trinidad and Tobago, as with many developing countries, the innovation systems may register great resistance from those parties that have not accepted this new paradigm, or who are unable to participate meaningfully in it. Johnson and Lundvall

(2003) point out that innovation usually causes economic as well as political responses within the economy; this they refer to as the 'power aspect' of innovation. Because some firms will be disadvantaged by others who use the available information and innovation systems, they will have to find another way to protect their interests, and this is achieved by political maneuvering. Thus the relevance of the influence of the innovative systems is directly correlated to the levels of openness of the economy, the more open the economy, the more likely that the innovation systems will be allowed to develop and flourish. This openness will be expanded here to include not only the integration into the world economy, but also (and possibly more importantly) the ability of access to the marketplace which will necessitate a drastic alteration of local policies that relate to taxation, financial sector risk taking (lending for entrepreneurial purposes), transparency, tendering and procurement, and intellectual property rights.

Historically, Trinidad and Tobago has not been accustomed to trade openness and as a consequence, its development (industrial and otherwise) has been skewed in favour of 'the protected', which has been a consequence of the political decision-making process since its independence. In other words, the development attempts can be seen to be more influenced by political rather than economic decision-making, and this has hampered growth, possibly more than any one factor in its economic history.

Johnson and Lundvall (2003) posit that the economy's innovative experimentation may be under threat if those in charge of politics and the economic power in the economy do not perceive that they will benefit from it, and as a consequence will use their power positions to thwart its development. As such there needs to be local 'buy-in' to the advantages of national innovation systems and trade openness in the Trinidad and Tobago economy.

One can then assume by the aforementioned arguments that the efficiency of allocating the factors of production may be less important than the openness of the economy for the national innovation systems to develop. This openness will determine to what extent the economies of developing countries like Trinidad and Tobago are allowed to develop, and any political or institutional hindrances will ultimately retard the process of development in the short-run, and jeopardize the participation in the global economy in the long-run.

Innovation systems do not develop naturally, they need to be developed and this development is predicated on the models used

to encourage and facilitate the free and fluid exchange of knowledge. In economies like Trinidad and Tobago, one needs to actively determine what areas need to be targeted and what facilities and policies will engender the levels and types of innovative thinking and development that is perceived as needed for sustained development, both presently and in the future.

One must recognize that firms are the major actors in the system regardless of the size of the economy. The firm is basically and fundamentally the conduit for turning sets of individual knowing into a collective competence and will be used for economic gain in one way or the other. A firm's competitive advantage is only achieved when it exploits this knowledge collection (from its employees) to give itself an advantage over all other actors in the system. As the theory espouses, it is the firm's willingness as well as its ability to continuously innovate and stay ahead of the other actors that will drive its development, and guarantee its ultimate survival, if not dominance in the system.

It has been argued that the same individuals, if placed in different organizational structures and circumstances, will probably produce very different competences. Additionally, of all the actors existing within any innovation system (research facilities, universities, think-tanks and inventors), it is only the firm which has the unique responsibility to combine together the multiple kinds of knowledge required for innovation; including knowledge of markets and internal organization and structuring. So while one pontificates developing innovation systems and policies, one needs to recognize that the basic unit of analysis can be none other than the firm.

The new firms need to be innovative and utilize the information that exists in the economy, but to do so; this must be an active function of the firm, not a one-off attempt to gain market share or maximize profits (as has usually been the experience in the region). Information is vital for progress, not only in society but for the survival of the firm itself. With this realization, the firm needs to be continuously sourcing new information and utilizing by experimentation this new knowledge to gain (or maintain) some sort of competitive edge in the economy. Research and Development must be an integral part of the firm's activities. The firm must now, more so than ever before in history, become an active player in the development and application of knowledge to ensure its survival and competitiveness. Of course, this perception is not readily found in small developing countries which are rife

with production inefficiencies, government corruption, oversized bureaucracies, lethargic banking systems and the like, thus making the almost-natural resistance to this approach almost understandable.

Writers like Rosenberg (1990), suggest that firms need to develop a capacity internally to synthesis and apply the available knowledge stock in the system, and this paper adds to the analysis by suggesting further that this activity helps them to develop their own competencies in information gathering and technological development. This capacity building usually takes up a significant portion of the Research and Development activity of the firms, of course recognizing that this usually precludes the smaller (small and medium sized) and less capitalized firms in the system; thus they cannot be expected to participate as effectively in the knowledge creation activities as would be the case for the larger, better funded firms. Interestingly, most of the firms found in Trinidad and Tobago fall into this category, and as such a new approach (possibly one predicated on partnerships and alliances) will be necessary if we are to benefit from these advantages that are evident from large scale endeavors in innovation creation and Research and Development.

Particularly in small developing nations like Trinidad and Tobago, the state needs to support and nurture Innovation systems and Competition policies. This increased government involvement should be directed to the infrastructural areas of education, labour mobility, network building, technology diffusion and transfer, taxation and public procurement policies.

While the government may be encouraged to support particular areas of new research and knowledge-building to give firms and other actors the needed confidence; it is ultimately the responsibility of the firms to avail themselves of these opportunities (Antonelli, 2005, Kaiser and Prange, 2004).

Additionally, the range of disciplinary skills available and their closeness to the world's best- practice frontier will also determine the national absorptive capacity of Trinidad and Tobago in its aim to adjust to the knowledge generated within foreign localities as well as locally. Science and technology are interdependent global systems and the formation of national (and in the case of CARICOM, regional) innovation systems will increasingly reflect a search for the best partners wherever they are located (Harvey and McMeekin, 2004).

In the area of best-practices, it should be realized that there are costs associated with forming network relationships; and these costs act as hindrances for the small and medium-sized businesses which characterize the economy. Of course these innovation-related activities present themselves as a range of tasks ranging from strategic partnerships, finding markets for technology licenses, to informal and inter-sectoral exchanges of information.

International technology transfer and innovation diffusion have been greatly enhanced by the increase advances in communication over the last half century. The movement of people and their skills has played a large part in the dissemination and diffusion of technologies internationally; and this is also a reality for the Trinidad and Tobago economy which has been subject to the process of 'brain-drain' as has been identified by many authors. Indeed, historically, the mobility of skilled individuals has been a principal form of technological flows internationally. To authors like Nelson (2004) network formation is crucial in the innovation processes, and similarly it is vitally important to keep the process open to the possibility of connection.

Of importance to Trinidad and Tobago are the kinds of policy instruments that may be used to facilitate innovation system building, as these will be determined by the ultimate objectives which may range from stimulating the formation of industry clusters to facilitating collaborative research between partners (local and foreign, governmental and non-governmental) or incubating University ideas; to using public procurement to build networks.

The policies' principal purpose is to create opportunities and enhance innovative capabilities by stimulating innovation system formation (Metcalf 1995, 2004; Smits and Kuhlmann, 2004). In relation to policy, it has been argued that innovation systems are complex systems in which the growth of knowledge changes the actors involved so that learning effects continually shift the relation between policy cause and innovative effect (Ockrutch, 2003). Similarly, it should be noted that there is no general basis for predicting which specific innovation systems will eventually take form or which major actors within the economy will emerge, and this implies an obvious corollary, that the connection between the respective instruments and their ultimately effects will be necessarily uncertain with a whole range of unanticipated outcomes. Possibly this is one of the factors that has hindered the development to of such policies locally in Trinidad and Tobago.

Competition policy can best be perceived as a policy whose existence will foster and enhance the spirit of competition within the economy and maintain economic and development growth through the natural evolution of this process. It is a policy that is neither limited in scope nor vision; it must, by necessity, be one that is allowed to develop based on the demands of the economy and enhanced by the prolific environment provided by the national governmental structure.

It is understood by the Endogenous Growth Theory and its proponents that those firms and industries which move ahead in competitive terms are more likely to be able to innovate and keep their competitive advantage indefinitely. It has also been argued that the ability to create a competitive advantage and to reflect this in a comparative trade advantage requires sustained investment in Research and Development (which is severely lacking in the Trinidad and Tobago economy, in both the private and governmental sectors); and this is less likely to be the case, the further down the international competitive ranking of the firm, and the economy.

For small developing economies like Trinidad and Tobago, a case has been made for the protection of the infant innovation firms (when they eventually come on stream). This is needed because of the imperfections of capital markets and the issues related to the choice of tariffs or subsidies to promote domestic competence formation. What is being suggested here is as an integrated package of industrial and trade policies that will encourage fledgling local capabilities and encourage the exploitation of these capabilities in an internationally competitive fashion.

Of concern to developing countries like Trinidad and Tobago is the degree to which they are presently integrated in a world innovation system and what they can do to increase their participation. Under the National Innovation Systems approach, the firm is viewed as the learning organization entrenched within the broader institutional framework that is national in scope and could therefore be leveraged towards innovation by policy interventions made by the governments on their behalf. It is this need to be integrated into the global economy that makes competitiveness a central feature of any new development strategy. Policies that are designed to build competitiveness must of necessity reflect realities of global environment with its focus on new products and processes.

Conceptually, globalization seems to have left national governments with fewer degrees of freedom. The production systems of many developing countries including Trinidad and Tobago have increasingly become part of an internationalized production system managed and coordinated at the global level by transnational corporations. These restrictions are exacerbated by the policies that increase the pressures being exerted on developing countries to be incorporated into the system by the governing body for trade and trade related activities (World Trade Organization). These policies are geared to eliminating national differences and create a more uniform, trans-nationalized innovation environment. By the recognition of this fact, one can measure the extent to which globalization shapes and constrains the parameters within which national actors make innovation decisions; though this does not mean that there is no room for maneuvering in the system.

CONCLUSION

It is being argued that successful economic development is closely linked to a country's capacity to acquire, absorb, disseminate, and apply modern technologies, a capacity embodied in its National Innovation System; and this is facilitated by the ability of that economy to use knowledge in a productive way.

There is the problem that developing economies like Trinidad and Tobago are basically typified by limited domestic linkages, a dualistic industry structure and underdeveloped knowledge bases, and due to the pattern of mercantilism and the history of European exploitation, it has not been able to build any substantial knowledge base; thus they find itself relying heavily on foreign technology and knowledge. The assumption is that this reliance on foreign sources of innovation may hinder the development of locally-based capability formation, indigenous learning, and technological innovation systems.

Mytelka and Oyeyinka (2003) provide a justification for governmental interventions to build competences and promote greater systemic cohesion in the developing countries, as the system has erected barriers to innovation systems development in the less developed countries of the world. There may be rigidities at the institutional or organizational level that resist change in the face of new conditions and challenges, and this has been seen in the case of the development of the higher education system, where the

legacy of nineteenth century colonialism has caused the inability of the economies to move towards their development objectives (Oyelaran-Oyeyinka).

In the Trinidad and Tobago economy it is argued that there is the widespread under-utilization of the existing knowledge networks and a severe lack of internal linkages locally. It has been found that in many instances, the knowledge producing institutions (universities and R&D laboratories where they exist) are centralized and remain estranged from producers.

Policy makers must also recognize that organizational performance is usually interrelated to the organizational structure and culture. The structure of the firms in the economy tends to be out-dated or family-oriented and as a result, modern techniques and efficiencies have been unable to develop along productive lines. Additionally the post-colonial culture of over-dependence on the government for protection (usually in the form of subsidies), and the low level of vision and initiative taken by the local entrepreneurs all but eliminate the processes of innovation and development in the economy.

What is being proposed it that there needs to be a strong and healthy relationship developed between the government, the research and training institutes and the productive sector if there is to be any development of a national innovation systems. While the responsibilities of the productive sector is not being understated, it is clear that the government needs to foster a fertile atmosphere for the co-ordination and planning of knowledge and economic production; as this will be invaluable to the development of the sustainable growth and continued innovation processes in the economy.

NOTES ON CONTRIBUTOR

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