Ki’nobo? Innovation Policy and its Economic Development Potential for Curacao

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ABSTRACT

The purpose of this research is to identify if an innovation policy, containing the stimulation of an innovation system, would have economic value for the island of Curacao. The economy of Curacao is very small and is service based, hinting some potential for innovative activities. Innovation system components can be observed in Curacao, however, they do not interact with each other. Innovation holding potential for economic development of countries raises the question “What is the value of this for a country?” Countries without natural resources can, by means of a greater innovation policy, access the international economy and become a link in the international supply chain. Would such a policy, including an innovation system have significant value for Curacao? And if so, what are the specific hurdles for Curacao? This research attempts to answer this question by means of a Delphi study with stakeholders of innovation, and potential innovation system components. Results show that the lack of an overall innovation policy indeed hampers the innovative potential of the island. Results also show other difficulties like technical capacity and socio-cultural issues that can discourage the proper functioning of this innovation policy. Furthermore there are no innovation stimuli like financing. A broad innovation policy covering also the issues of technical capacity building and paradigm shifts of society would have an immense value for the island of Curacao. Government should take the lead role and organize a system in which it provides sufficient stimuli allowing components to interact and be innovative.

Keywords: Innovation, Innovation Policy, Governance

INTRODUCTION

Curacao is a southern Caribbean island which is a constituent country of the Kingdom of the Netherlands. Observations and investment literature (Dienst Economische Zaken, 2008) shows that Curacao holds a strategic position in the Caribbean right between North and South America. With economic development in mind this research intends to propose Innovation Policy as an option. The role of innovation in economic development has been signaled ever since Adam Smith’s “the Wealth of Nations”(1776), but was not considered at the center of wealth creation since the eras of Schumpeter (1942). By engaging in innovation policies countries readjust their competitive standing in the international arena and gear themselves more and more towards export and economic growth.

Modern development theory suggests that governments should focus on innovation and technological advancement aiming at attracting foreign investment (Trubek, 2008). By doing so, governments reequip the country and place themselves strategically advantageous as opposed to other countries. For Curacao the question remains if the aspects relevant for innovation as depicted by Abramovitz (1986) are present enough allowing for innovation policy to be implemented. How would Curacao be able to use an Innovation Policy in economic development?

The possibility of becoming a knowledge economy is interesting and could possibly be achieved with the proper implementation of an innovation policy (Dienst Economische Zaken, 2009). An innovation centered policy can allow the economy of Curacao to link itself to the International arena, by means of becoming part of the global supply chain. This will help the trading position of the island (Trubek, 2008).

The paper is structured as follows; Chapter 2 introduces the economic theories behind innovation and the macro effects it can have for countries, specifically focusing on an innovation system. Chapter 3 deals with the development policy aspect and why innovation has become an important component thereof. Sub-sequentially the economy of Curacao is presented, with all the relevant factors supporting and or hampering innovation in Chapter 4, whereas Chapter 5 will introduce the hypotheses. Chapter 6 will evaluate these statements and finally present conclusions and recommendations in Chapter 7.
ECONOMICS OF INNOVATION

Economic History

Ever since the beginnings of economic thought economists have sought for growth theories in which countries (and later on firms) could achieve growth with the use of the scarce resources. This economic growth would have benefits in raising welfare for the community and eventually relieving the lesser off. The primary idea was that by specializing firms could reach efficiency levels that can spur economic growth (Smith, 1776). This is known as the “division of labor” where a production process (or any other process for that matter) could be separated into smaller actions to, each at which one laborer would be assigned. As a consequence of this division more output can be achieved with the same levels of labor input. In this analysis Adam Smith also saw the potential of these laborers to enhance their performance, but this was seen as limited to do so because of the simplicity of their labor as a result of the division of labor.

Other outputs of the division of labor are inventions, as processes are carefully enhanced by new machinery (in industrialization) and new methods of production (process innovation). Smith argued that this was not at the center of wealth creation, as he argued that “division of labor is considered the great generator of invention and improvement” and they “originally owed their existence to the division of labor”(1776). Economists such as Rae (1843) and Schumpeter (1942), on the other hand, placed much emphasis on this matter as they argued that innovation was the heart of wealth creation. By engaging into the process of innovation firms and individuals get many opportunities that can positively influence economic growth and cause the country to be better off.

Following Smith, Rae (1834) argued later on that inventions lie at the heart of wealth creation, enabling nations to develop economically. He greatly distanced himself from Smith’s argument that the division of labor could add more value to the innovation. Mills on the other hand pointed out that innovation did not automatically contribute to the development of the “ordinary people”. This conclusion highlights the early notice of importance of equality in economic growth, which supports the idea of economic development rather than simply economic growth. Schumpeter’s argument that innovation comes from entrepreneurs in the economy, wild spirits if you may, stepped away from Mill’s rather socialistic idea. He proposed that the population can drive itself up by having these entrepreneurs (for him also synonymous to innovators) and produce wealth for the entire society due to their drive for profits (Schumpeter, 1934). The human development aspect is seen as a sustainable force in maintaining welfare, as these individuals would not have to rely solely on entrepreneurs but also on the knowledge they can acquire by participating in economic activity. A relevant factor would be experience in the organization and management of large scaled enterprises, underlining the relevance of the presence of Multinational Enterprises (MNE’s). MNE’s are thus important for the commercialization of successful innovations but also for grooming potential entrepreneurs.

Economic growth differs from economic development in the sense that the latter includes social and technological progress1. Nowadays economic development encompasses more than just quantitative measures like GDP etc., as human development has become an integral part because of the positive externalities associated with economic growth (de Feyter, 2001). Economic development thus places more emphasis on the usefulness of innovation as an economic driving force, because of its association with technology. Innovation is quite often associated with technological advancement in economic discussions, but encompasses more aspects that will be addressed later on in this chapter. Nevertheless, it represents a great potential for economic development as it is the source of wealth creation (Schumpeter, 1942).

Furthermore the drivers of innovation would, according to Schumpeter (1942) be enterprises as they dispose of resources necessary to engage in R&D activities. Enterprises would also serve as to provide resources to entrepreneurs, by means of experience with managerial structures, corporate culture and exposure to technologies and research (Schumpeter, 1942; Meyer, 2004).

Innovation

Innovation refers to products of the mind that are new or improved. The process of innovation requires significant input and time. But the results could imply significant savings (efficiency) and wealth creation for the inventor. Creation of wealth is considered essential for economic development in terms of increasing welfare.

Innovation requires research and creativity to continue to a potential solution in the invention phase. Innovation also targets markets that are under served and can be exploited by entrepreneurs (Bessant & Tidd, 2007). When the invention solves the problem at hand (i.e. is effective) this moves on to the design and development phase, where it is streamlined to be efficient. After completing this phase it becomes a fully fledged innovation output that is ready for use within the market (Schumpeter, 1942; Swann, 2009). Innovation is, however, far more than just outputs that can be protected by Intellectual Property Rights. Bulk of innovation goes usually undetected as improvements and efficiencies in products, but these are also part of innovation and can contribute grandly to the economy (Swann, 2009).

Economic Development & Innovation

In the “classical political economy”, economists emphasized accumulated capital per worker in explaining differences in income or productivity (Fagerberg, Srholec, & Verspagen, 2009; Swann, 2009; Trubek, 2008). As this shifted towards including the aspect of technological progress it was expected that countries would all develop at

1 Source: World Bank 2009
the same rate and that all countries would converge and be equal. (Fagerberg, Srholec, & Verspagen, 2009). But countries do not have the same starting points and have different dynamics that influence this process of development. Conditions in the international arena and differences in absorptive capacity can slow down or speed up the process. The political influence of other countries via their development agencies influences the outcomes for developing countries, and thus also influences the dynamics, of this process. Furthermore other issues like history and/or geography can also influence the dynamics and are relevant factors in development countries (Acemoglu, Johnson, & A., 2001; Gallup, Jeffrey, Sachs, & Mellinger, 1991) especially those that have been colonized.

With this the only feature that could explain differences in GDP are the “transitional dynamics” (Fagerberg, Srholec, & Verspagen, 2009). The initial conditions vary from country to country therefore encouraging differential development statistics. So in order for country’s that lack transitional dynamics to get to the point of equality they should engage in policies that helps them to catch up (Fagerberg, Srholec, & Verspagen, Innovation and Economic Development, 2009).

According to Fagerberg, Srholec and Verspagen (2009) knowledge is heavily correlated with economic development, as the subset of knowledge that deals with production and allocation is called “technology”. This is represented in economic development as social and technological progress. Knowledge is relevant to deal with enhanced levels of technology and new methods of doing thing, be it production or not. Innovation therefore also regards education as an important component for its success, highlighting the relevance of social development. Individuals should be competent enough to not only learn from educators, but also from colleagues. In order to do so they should have higher levels of social capabilities and networking skills. Knowledge being a public good indicates that the creation of knowledge needs to form part of innovation policy.

Government should also engage in more push factors with regards to innovation to support the technological progress. This is where innovation policy becomes useful to stimulate inventors. Inventors and developers of patentable inventions will only engage in this, potentially, costly and lengthy process if they are assured that they can reap the profits of their innovation. It is hereby made clear that an important step in innovation policy is an appropriate Intellectual Property Code.

**Innovation Systems**

Innovation systems are therefore set up in order to aid the process of innovation and the flow of information between people, enterprises, and institutions. An innovation system as connoted by Edquist (2001) consists of two entities: components and relations. Together these two compose a whole that can be referred to as a system. As a third criterion it should be possible to discriminate in the system, otherwise known as determining boundaries. The components in this system are known to be organizations (firms, governmental departments etc.) and Institutions (rules, habits, common habits, policies, etc.) that regulate interaction between organizations. Institutions play an important part in determining the complementarities or substitutability of the different modes of coordination (Dunning & Lundan, 2008). They thus greatly shape the relations and determine linkages that are essential to the innovation system.

A system of innovation could take many forms and be targeted to an array of areas, such as regional innovation, sectoral innovation systems and alike (Edquist, 2001). An example would be Silicon Valley where a specific area has developed into an innovation system, particularly focusing on Information Technology.

The institution of a national innovation system includes the establishment and/or reinforcement/restructuring of some institutions involved. Capital availability and presence of financial markets is also essential. These will facilitate the establishment of private organizations that can, together with public entities, interact in the innovation process (Schumpeter, 1942; Meyer, 2004; Rugman & Verbeke, 1998). Government should then create its own components of the system, for starters, that can serve as a catalyst for the expansion of the capacity in, innovation capital institutions (CVC and Innovation loans), research laboratories and other R&D facilities. Stimulating network activities of innovative firms is also an aspect of national innovation systems as companies could use outside knowledge to develop their innovative capacity (OECD, 1997).

Liu and White (2001) identify five fundamental activities of innovation systems being: research, implementation, end-use, linkages, and education. A major task of the innovation system would be to bring together complementary knowledge allowing technological capacity of firms to enhance those of others and result into the creation of more wealth.

In order to support this innovation system Governments should consider the social capabilities of its citizens together with their absorptive capacity (Abramovitz, 1986). Abramovitz mentions also honesty and trust as a relevant factor as a precondition. This will allow the establishment of linkages and contacts that can support firm development and alliances for potential new product developments. Finally government stability, commitment in effectuating policies is also a precondition.

**CONTEMPORARY DEVELOPMENT POLICY AND INNOVATION**

**Development**

Development as defined by the United Nations (UN) in the Declaration on the Right to Development, is a
Economic policies therefore are the hardcore of development policies as implied by de Feyter (2001): “The human development idea was a response to the equation of economic development...” Prior to this shift (economic) development was only measured by economic growth, i.e. rise in national income or product, and fundamental changes in the economy (de Feyter, 2001). The UN and the World Bank therefore agrees that economic growth is a necessary component of, but not synonymous to, development. Development includes social and technological progress as mentioned before, but is guided through economic policy.

Looking at the developments in the past where governments had an active role in economic growth, the Washington consensus era suggested a more passive role of the state. Institutions such as the International Monetary Fund (IMF), the World Bank and the US Department of Treasury provided for a set of economic policies that would be standard in developing countries that have been hit by economic and financial crises of the 1980’s (Trubek, 2008). The ideas of moving towards a free market arose, where it was important to de-regulate. Government had only 10 rules to live by and those were: fiscal discipline, broad based provision of pro-growth services, tax reform, deregulation of interest rates, competitive exchange rates, trade liberalization, privatization of state enterprises, liberalization of inward FDI, and the legal protection of private property. The relationship between public and private organizations should in this sphere be less authoritative and more facilitative. With this in mind an entire new set of institutions had to come in place to ensure the protection of private property with the state being a passive player.

Washington Consensus vs. NPED

The Washington Consensus generally failed because they disregarded transitional dynamics of countries and the source of the economic problem (Rodrik, 2006). Trubek (2008) proposes the creation of a New Political Economy of Development (NPED). This NPED places strong emphasis on technological capacity as a key element in any strategy to maintain global competitiveness and penetrate advanced markets.

The NPED has highlighted a number of issues which have led to a reappraisal of the role of the state. Amongst the relevant for this thesis, as presented by Trubek: Strategic trade theory, Networks, Technological capacity, and Innovation.

Fagerberg et al (2009) argue similarly that innovation contributes immensely to economic development and thus should be a base strategic tool for economic development. With the suggested increase in importance of technical knowledge and technological capacity, states can play a role in expanding these (Trubek, 2008).

MNE’s, Development & Innovation

MNE’s are best considered as a coordinator of a system of domestic and foreign activities that are controlled and managed by it (Dunning & Lundan, 2008). Each establishment has its own set of management surrounding, housing different suppliers, competitors, and conditions. Diversity within the firm could also contribute to the networking capacity of MNE’s. MNE’s would enhance the innovation system by adding more network contacts to increase the innovative capacity of domestic firms. This will, however, not happen as efficient if the networking and absorptive capacity of firms is low, underlining thus the importance of government stimulus for the development of networking capabilities.

MNE’s are involved globally in innovation, aiming at maintaining their competitive advantage as opposed competitors (Lawson & Samson, 2001). Significant amount of management literature focus on innovation as a dynamic capability (Bessant & Tidd, 2007; Armstrong & Kotler, 2006; Besanko, Dranove, Shanley, & Schaefer, 2003) enabling companies to maintain their competitive advantage. With this global engagement MNE’s are subject to international quality standards which enhance the benefit of technological progress for all. MNE’s represent major production efficiencies and continue to enhance these to benefit from economies of scale.

Figure 1 Source: Meyer (2004)

MNE’s have impact on their local environment based on what they do and how they do it (Meyer, 2004). The opportunity to form linkages and partnerships could facilitate networking. By incorporating the impact of MNE’s in innovation policy, governments can enhance interaction between them and local firms and spur economic development. Effective development policy requires close coordination between public and private actors (Trubek, 2008), and it is thus relevant and necessary to include their participation in economic development. MNE’s can help commercialize ideas but also build
experiences for locals in order to spur the entrepreneurial spirit. Small and new economies can use the network of MNE’s to get access to the international market and globalize.

By entering a country an MNE already contributes to the economy by means of interaction with local components. When considering the employment of locals, the contribution shifts significantly as locals get insight into new horizons and different (international) standards (Meyer, 2004), this is known as knowledge spillover. Companies in innovative industries also contribute with technological spillover when introducing their technologies and standards to the economy and this adds to the social and technological progress. The growth of FDI in developing countries is of particular importance since in addition to finance the recipient economy also benefits in terms of technology transfer and enhanced access to export markets (de Feyter, 1997).

**Development and Innovation Policy**

Cross analyzing Schumpeter (1934; 1945) and Trubek (2008) and development policies presented before a convergence in political system is expected, where a type of socialism that will direct attention to entrepreneurship, innovation, and new product development will emerge. This will allow countries to reshape their economic status within the world economy and focus on a comparative advantage in production of goods and services (Trubek, 2008). Like firms countries will compete to maintain their competitive advantage and dynamic capabilities.

To a more specific aspect, Trubek (2008) focuses on the centrality of learning as a relevant factor in the NPED. When countries focus on this, they include all elements necessary for innovation, namely: education and knowledge, networks effects, and encourage linkages between public and private sector. All of these are areas which scholars (Abramovitz, 1986; Edquist, 2001; Lundvall & Borrás, 2005; Schumpeter, Capitalism, Socialism and Democracy, 1942) have connoted to be relevant for the process of innovation and are thus necessary components of innovation policy.

Another important factor of an innovation policy could be the development of the countries absorptive capacity (Abramovitz, 1986). It would be very inefficient if firms within the economy do not dispose of absorptive capacity to take over the knowledge and transpose it into innovation. In order to foster this it is relevant for firms to tap up with MNE’s in their own branch as the learning’s hereof are different than learning from unrelated businesses (Martin & Salomon, 2003). The precondition here is that MNE’s should be willing to teach local firms, something that can be facilitated by an innovation system. As it is made visible in Figure 3, the FDI project of an MNE interacts with institutions like policy, business regulation and establishment incentives. The implication for policymakers would be that their attempts to direct or enhance innovation would have to be based on the accurate understanding of the sources of innovation (von Hippel, 1988).

**ECONOMIC DEVELOPMENT IN CURACAO**

**Economic Status**

**Political**

Curacao is a southern Caribbean island which a constituent country within the Kingdom of the Netherlands. The island has just entered this status on October 10th 2010, leaving the federation called the Netherlands Antilles. Economic policy was split between federal and island territory responsibility, the former encompassing regulations and the latter encompassing tourism and (local) commerce.

Trust is quite high in the jurisdiction, as the high court of the Netherlands also serves as the Supreme Court, this is seen as a very stable aspect of Curacao and is stated in diverse investment documents. Government finance hasn’t been stable after the millennium change, but has drastically increased after the constitutional changes, as a result of a debt solution offered by the Netherlands, which helped Curacao to minimize effects of the financial crisis. The political sphere is quite stable with some initial delay for investors, hinting at the lack of resources at the department of economic affairs, and governmental change influences. Labor unions hold significant power and thus pressure a stable labor environment which is difficult to alter without consent. The business association, Vereniging Bedrijfsleven Curacao (VBC) also has much input on the business environment and has a very large membership. Investors can thus be assured of a stable business environment with potential delay due to lack of resources from the public side.

**Economic**

Curacao still hosts the currency of the former Netherlands Antilles together with St Martin, the Dutch Antillean Guilder (NAF, ANG). This monetary unit is issued by the Bank of the Netherlands Antilles (Nob Central Bank of Curacao & St Martin) which also commands the monetary policy of the federation. The Guilder has been pegged to the US Dollar ever since the 1970’s because of the extensive trade relations with the USA and for stability. With Constitutional reform in mind it has been discussed to dollarize the economy by adopting the US Dollar as a new legal tender, and repositioning the Bank as a supervisor.

Figure 2 Netherlands Antilles: Real GDP growth and inflation

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3 1 USD= 1.77 ANG
4 Then as a Bank of Curacao
As portrayed by the Department of Economic Affairs, supported by the Central Bureau of Statistics, Curacao enjoys a steady economic situation where inflation is low, averaging 2.5% (Bank of the Netherlands Antilles, 2009) until peaking in 2008 as a result of the financial crisis, as can be seen in figure 4. A reported majority of trade, 75% (Bank of the Netherlands Antilles, 2009) is done with the United States, making the position of Curacao quite dependant. The Government of the Netherlands has pledged to finance the national debt of roughly ANG. 6 Billion Together with the installation of a financial committee that approves the budgets of the islands and the federation.

The main economic pillars in Curacao are Tourism, Financial Services and Oil Refinery. Ever since the 1990’s the governments have pursued strategies to diversify the economy, towards a knowledge based economy (Dienst Economische Zaken, 2008). Smaller segments, such as transshipment, trade, logistics and telecommunications, have been present or have emerged but are still on a small stable basis. The financial services sector mainly caters to the international market in the form of Trust Agencies, International Banking, Mutual Funds, and Wealth Management. These companies thus would not be suited to finance innovation in Curacao. Relevant financial institutions are found in the stakeholder analysis section of this chapter.

Curacao does not have a standalone policy for innovation, which is the reason why this research is being conducted. Policy Makers (Curie, 2009) quoted the lack of human resources and split between federal and island responsibility as main problems. They mention that currently innovation is being supported by means of subsidies for new products without evaluations. These are done via the Innovation Center which in its turn is mostly in charge with quality aspects of doing business. The financing of innovation is also bound to change as the countries agreed to a Social-Economic Initiative (SEI) funding system, which will alter the structure and procedures for application. This development highlights the relevance of introducing an innovation policy to govern these funds and the development which corresponds to innovation. A very particular aspect of the SEI is that it focuses on the social and economic development in terms of labor, projects are aimed at supplying qualified personnel and jobs (Dienst Economische Zaken, 2008).

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**Table 1 GDP Development**

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>5.4</td>
<td>5.6</td>
<td>5.8</td>
<td>6.1</td>
<td>6.5</td>
<td>7.1</td>
</tr>
<tr>
<td>Real GDP</td>
<td>1.7%</td>
<td>1.2%</td>
<td>1.1%</td>
<td>2.3%</td>
<td>3.8%</td>
<td>2.0%</td>
</tr>
<tr>
<td>GDP per</td>
<td>30.438</td>
<td>31.212</td>
<td>31.213</td>
<td>33.872</td>
<td>33.761</td>
<td>36.288</td>
</tr>
<tr>
<td>Capita</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflation</td>
<td>1.6%</td>
<td>1.6%</td>
<td>3.7%</td>
<td>2.8%</td>
<td>2.8%</td>
<td>6.3%</td>
</tr>
<tr>
<td>Unemployment rate (%)</td>
<td>15.3%</td>
<td>15.4%</td>
<td>16.2%</td>
<td>13.2%</td>
<td>11.5%</td>
<td>9.7%</td>
</tr>
</tbody>
</table>

Source: Central Bureau of Statistics

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**Table 2 Labor market developments in the Netherlands Antilles (Number of persons)**

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed</td>
<td>74,445</td>
<td>74,777</td>
<td>76,213</td>
<td>78,733</td>
<td>82,722</td>
<td>87,069</td>
</tr>
<tr>
<td>Unemloyed</td>
<td>13,439</td>
<td>13,286</td>
<td>14,752</td>
<td>11,904</td>
<td>10,707</td>
<td>9,347</td>
</tr>
<tr>
<td>Labor force</td>
<td>87,884</td>
<td>88,063</td>
<td>90,965</td>
<td>90,277</td>
<td>93,429</td>
<td>96,416</td>
</tr>
<tr>
<td>Total population</td>
<td>177,291</td>
<td>179,942</td>
<td>183,817</td>
<td>186,088</td>
<td>192,552</td>
<td>195,644</td>
</tr>
<tr>
<td>Participation rate</td>
<td>49.5%</td>
<td>48.9%</td>
<td>49.0%</td>
<td>48.0%</td>
<td>48.5%</td>
<td>49.7%</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>15.3%</td>
<td>15.1%</td>
<td>16.2%</td>
<td>13.2%</td>
<td>11.5%</td>
<td>9.7%</td>
</tr>
</tbody>
</table>

Source: Central Bureau of Statistics and BNA estimate

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**Social**

Elemental in the innovation policy is the cultural aspect. The citizens of the country should also be aware of the development of innovations and contribute to it (Mani & Romijn, 2004). A culture of change acceptance and an entrepreneurial spirit would also soften the blow. The implication thus for an innovation policy is to also foster awareness of the policy and include projects in which citizens (the bourgeois, as stated by Schumpeter) are encouraged to adopt innovations, by adding to their technical capacity and the highlighting the economic relevance for them.

**Curacao’s population sums roughly 150,000 inhabitants with interesting features. The community in Curacao is composed of at least 60 nationalities. The common Curacaan speaks at least for languages**, though with

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5 The standard four include Papiamento (Native), Dutch, English and Spanish. Popular are Chinese (Cantonese), Portuguese, Arabic due to the big colonies and French to a lesser extent.
varying fluency, an interesting factor for investors from North, Central and South America. The population suffers from a moderate brain drain as one third of students leave the island to study in the Netherlands right after high school (Curie, 2009). Many of these students go for specific and specialized studies which can be of great added value in an innovative economy. They, however, don’t return as quickly as possible, sometimes not at all, because of more interesting opportunities abroad. There was also a high migration flow towards the Netherlands at the turn of the millennium due to the economic slowdown. An estimated 100,000 additional Curacaos live in the Netherlands.

Table 3 shows the labor developments for the years 2003-2008 and depicts a good development in terms of employment and growth for the Netherlands Antilles. Main shifts are cause by Curacao.

Sociologist Frank Quirindongo concluded that the society of Curacao is quite unique, with its "protectorate" status of the country; the population is very risk averse. This is also a hurdle for accepting innovations as the society is very limited towards an island way of thinking (Quirindongo, 2007). Aside from this, resistance to change is quite high as the baby boomer generation and generation x tend to be loyal to the organization they work at and be employed there basically their entire career. Their position within the organization thus has immense value for them as they see it as a battle they have “won”. Whenever change is being implemented or innovations are run they resist as they see it as a threat to their position. It also makes it difficult for people to cooperate and link to each other because of the fear of losing the control on their responsibilities, and the consequences that could bring.

The culture of fear is also still present as a result of the slavery history (Quirindongo, 2007). Many businesses with new ideas start but disappear after 2 years as they do not get a great enough basis to survive. Nevertheless, carefully marketed innovations have found their way and are quite successful (Dienst Economische Zaken, 2009). The entrepreneurial spirit is thus the determinant factor.

At least 50% of the population has a high school degree, predominantly between the ages of 30 and 50. This is quite common as this generation could have been employed in a semi skilled position right out of high school. This is a challenge for high R&D industries, observing mainly low tech applications on the island. Education and the stimulation of an innovative population are relevant for the innovation policy of Curacao. A lion share of the academics hold foreign diplomas.

**Technological**

Technological level of Curacao is difficult to assess for an array of reasons: definition, scope and measurement. The definition of technology is quite different as many sources on Curacao refer mostly to communication technology. Telecommunication accounts for a mass of the technology on the island; elements of this are government involvement in telecom companies, United Telecommunication Systems (UTS). The use of Information and Communication Technologies are also being stimulated by government, via the STIMUL-IT initiative. Small and Medium Enterprises are encouraged and supported when implementing ICT systems in their businesses. Industrial technology, with regards to oil refining technology and water desalination systems, account for another big portion of the technological sphere in Curacao. Smaller technological elements are found in construction on a low technology level, and manufacturing plants at the Brievenaat Industrial Zone also on a low technology basis (Dienst Economische Zaken, 2008). Production can be quite expensive because of utility costs.

**Competitive Advantage**

Fagerberg et al (2007) identify 4 variables that show the competitiveness of nations with regards to the catching up process being, aspects of technology, capacity, demand, and price competitiveness of nations as determinants. On the lines of technology, capacity and demand they argue more or less in the lines of Trubek (2008) that a competitive advantage can be created by governments. Relevant institutions shape demand, as they can e.g. facilitate the exploitation of some innovations, which in turn can generate resources to develop other innovations (Lawson & Samson, 2001). An important aspect in the technological competitiveness is the increasing widespread use of ICT (Fagerberg, Shrolec, & Knell, 2007).

Curacao still possesses a competitive advantage when compared to its counterparts in the Caribbean. Curacao has a stable political sphere, is located strategically between Europe, North- and South America. The island also lies outside of the Hurricane belt of the Caribbean making it less prone to catastrophes. Citizens are already familiar speaking 4 languages; this can be intensified to attract investor interest. This investor interest can also be translated in opportunities to create linkages towards the Research and Development of innovations. The size of the population is small enough to make a cultural overhaul towards technical capacity, and thus innovation feasible in a short amount of time.

**METHODOLOGY**

**Research Propositions**

As discussed in chapter 2 of this thesis innovation clearly has economic growth potential and deserves serious attention by competent authorities. More and more development economists and international development scholars have seen the ability of innovation to capture both of these aspects, if implemented appropriately. Governments should consider innovation systems as the broad arena in which the innovation policy will play. Considering the existing components this research proposes the following statement:

Many elements of an innovation system are already present in Curacao, it’s all a matter of coordination: Coordination and linkages are the main aspects of the innovation system which government should focus on.
With the idea of economic diversification it is difficult to look at developing already existing innovative sectors in Curacao, because the entire idea is not to depend on the same economic pillars. Economic interaction amongst industries will remain, especially in an economy as small as that of Curacao. Because of the size there is still some difficulties in assessing sectors to attract. Paragraph 3.2 discusses that the NPED allows countries without natural resources to create their own competitive advantage, by attracting specific parts of the business chain. By doing so Curacao would build a sustainable basis, which it can apply to more sectors. Curacao should then focus on a specific part of this chain being that which has the most externalities leading to the knowledge economy, e.g. R&D.

The most relevant sectors to start off conducting R&D in Curacao are Communication and Information Technology, Industrial Technologies, and Sustainable Technologies.

Considering the social composition and issues discussed in chapter 4, this research finds that fragmentation within components would discourage efficiency in cooperation and arrives at the following proposition:

While it might be wise to specialize it would be better to pool resources due to limitations. The higher the fragmentation of entities that support innovation the more barriers for innovative activity and innovation.

Chapter 4 widely discussed the social status of Curacao’s inhabitants with regards to innovation and change. The effects this will have for absorptive capacity and the positive externalities of innovation can be drastic. In order to support this innovation system Governments should consider the social capabilities of its citizens together with their absorptive capacity. The literature analyzed in paragraph 2.3 and 3.3 also highlighted the importance of experience in the organization and management of large scaled enterprises as a needed factor. Paragraph 3.3 also discusses the economic power and potential which upcoming countries can use to access the world, grow, and develop. MNE’s have the necessary networks that countries need in order to fit in the international global chain, are important for the commercialization of successful innovations but also for grooming potential entrepreneurs.

Governments should focus on the initial provision technical capacity, financing and innovation culture aimed at attracting MNE’s to further develop these and support R&D activity.

Research Method
This research will attempt to answer the question: “How would an innovation policy contribute to the economic development of Curacao?” In order to provide a discussion, leading to answers for the Government of Curacao, a Delphi study will be conducted amongst those that are knowledgeable and responsible for innovation in Curacao.

Delphi studies attempt to answer questions on the basis of interviewing knowledgeable and experienced people in the field in several rounds. At the end of each round the participants are supplied with a summary of findings from all respondents, allowing them to revisit their answers. This provides a convergent answer that is perceived to be the “right” answer to the question at hand (Hair, Babin, & Money, 2003).

A Delphi study has been chosen on the basis of 3 relevant benefits it possesses for Curacao, the first being a small pool of persons dealing with this particular subject, making a survey redundant. The ability of doing multiple rounds would, secondly, also add more value and potential qualitative basis of the study rather than doing simple interviews. Finally a Delphi study would be more appropriate because of the topics infant nature in Curacao. Given the qualitative background of this case study and its specificity, the availability of methods for research was not vast. A Delphi study would conveniently cover the needs of the economy and the complications of implementation, once the correct people are interviewed.

The deliverables of a Delphi study with the individuals that will be the ones implementing the system, thus those that will be working together, would enhance the conclusions and recommendations. Another very relevant case specific aspect is that the fragmentation in the current innovation sphere would also benefit from a convergent opinion on the path to be chosen for innovation on the island, making a Delphi study the optimal choice.

The interviewees have been chosen on the basis of their relevance with the innovation in Curacao, and their potential role in the innovation system to be. Based on the questions asked in the prior section of this chapter the following individuals have been chosen:

- Ms. Fiona Curie, M.Sc., Policy Advisor at the Department of Economics for Innovation
- Mr. Javier Samson, M.Sc., Director of the Innovation Center
- Mr. Richard Martina, M.Sc., M.A., Assistant professor of Innovation
- Ms. Margit de Freitas, MBA, Assistant professor of Marketing
- Mr. Thyrone Magloire, MBA, Policy Advisor at the Directorate of Economic Affairs
- Mr. Shurmel Elias, United Telecommunication Services

Adjustments made in the research process
People are inclined to provide overestimated and over positive stories. In order to account for this it will be relevant to ask their opinion after the session is completed to cross check how this might have influenced their answers.

It was planned to conduct 3 rounds in this study, but after the results of the second round this was seen as excessive
as the respondents agreed and found themselves in the proceeds of the first round. It is, however, still possible that they do not agree with certain points, and reacted positively because they have observed their answers in the proceeds. In order to conclude this research, a focus was drawn to points they did agree to more, which were also more central to the research.

**DISCUSSION**

**Concentrating on coordination and linkages**

Indeed many of the relevant components such as universities, NGO’s and entrepreneurial support agencies are present on the island. The fact that many organizations have their own separate goals, rather than a collective purpose, impedes cooperation amongst components. Many of the components are government related and it is quite easy to adjust the purposes of the components to achieve the clear necessity to link with each other. At the moment the necessity and tasks related to innovation lie not with the components, but with Government. This hints also at the absence of an overall innovation policy covering all relevant factors that facilitate innovation. At the moment only the department of economic affairs and that of education is in charge of innovation, but on two completely different arenas, being SME’s & Innovation, and Innovation in Education. The attitudes of agents in the system also make it difficult, as the political arena tries to fragment components as a strategy to attain power, which in turn makes coordination difficult.

Respondents signaled in the second round that an intricate plan for innovation set by government, as a result of proper research, is necessary in order to guide innovation in Curacao. This plan should not only cover setting new goals for components, but also, and mainly, the introduction of effective incentives to which components can react to. Some respondents argue that even without setting specific innovation goals for components, they would be inclined to linkages provided that there are relevant incentives to do so. There is little research done on innovation in the Curacaonian economy that hints at the gains of innovation, which also sustains the mentality against the need for innovation. The ever present resistance to change is fed by this mentality which on the long run has created a “more of the same” management approach. To quote one respondent “We have always done things this way and it has worked fine, why fix it if it isn’t broken”. Market focus has also been damaged by this attitude, as entrepreneurs do not focus much on the opportunities within the region, this is also a risk averse/more of the same way of thinking.

Another aspect of innovation that Government should focus on is financing. Innovators are faced with increased risk as compared to other entrepreneurs and require different financing schemes. The quest into the unknown can be costly. Respondents argue that innovators are faced with the conventional financial analyses and are therefore constrained to innovate. The financing aspect for innovation is simply not there. Even though there are some small grants for innovation, respondents argue that these do not support all chains of the innovation process effectively, thus enhancing the struggle for innovators. Respondents also facilitate by saying that the funds need not come from the government budget of Curacao; a short term solution might be appropriate and timely information on international funds available for innovation.  

Finally, respondents point at the need for technical capacity. Innovation and creativity are not rewarded in the education system, which also supports the mentality and resistance to novelties. The coordination of the education chain, and inclusion of innovation and creativity aspects within that system, is vital in supporting the behavior of individuals once they hit the labor market, being either before or after higher education. The main point that came through after the second round was that education should thus be integral part of the overall innovation policy.

**R&D intensive sectors in Curacao**

The general conclusion here was that more research should be done on all potential industries and choices should be made by government allowing for specialization and the effective attraction of MNE’s. There should be a balance between intensification and diversification. The head start benefits Curacao tremendously, but Government should also start by finding new sectors. Being more effective with current resources would also spur clusters and stimulate repatriation and FDI in industries. The environmental impact and current strengths were important factors in this conclusion.

Many respondents pointed at the current plans and actions taken in the creation of an information society, as they are/have been involved in this platform. This could have been of influence as many respondents signaled ICT as the most relevant industry for Curacao. ICT was also mentioned as a relevant industry because of its service based approach and its small environmental impact. ICT consulting is an interesting choice, as ICT is applied in a wide range of services on the island. Respondents not involved in this platform signaled that a similar, yet broader platform for innovation would generally need to precede the selection and goal setting phase or an innovation policy.

Continuing on service based, respondents argue that the current international financial services should also be an innovative industry by means of exploiting current products in new markets and innovating in current markets. This industry is very promising and can push Curacao as an establishment haven. The main idea amongst the respondents was that Curacao should be a knowledge based economy, and that jobs created should require highly skilled laborers. This will create international prestige of

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7 Curacaos have the Dutch nationality and can sometimes qualify for grants from for example the EU or even the Dutch Government. There might be some resistance though, by the way these schemes may work, as Curacaos have a long historical ties with the Netherlands.

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6 A list of components is provided in the Annex
Curacao and pull other industries to cluster around it. In this light they recommend also that Curacao would become a member of the World Trade Organization, allowing for more benefits as a developing country.

Population growth is also necessary to allow industries to further develop as clusters. The larger the population the more specialized components can get and the more Curacao can fit in the international supply chain. This is specific for the Curacao society as individuals are challenged with diverse aspects simultaneously, facilitating the survival of people with general skills. The fact that many candidates migrate to the Netherlands for higher education and do not return, or stall their return, also affects innovation. This reduces the quantity of specialists which induces the remaining ones to underperform.

**Fragmentation in the Innovation System**
All entrepreneurs are faced with the fragmentation issue in Curacao, so relevant components should be put together or readjusted allowing entrepreneurial ease. Innovators on the other hand need more support at the moment, as the mentality against novelties might hinder not only them in their process but also market acceptance, in terms of schema’s and scripts. Innovators are faced with increased risk and uncertainty, so they should be provided with those tools that facilitate their engagement. Examples of these would be a special department within the Innovation Center, and special financing schemes with discriminating risk analysis. Entities such as incubators and technology parks would also be arenas that components could develop to stimulate entrepreneurs.

Respondents see their organization as important players but all perceive that they do not operate at capacity. This induces the thinking that maybe assigning a specific innovation task or goal to them might be effective. The university and the innovation center are the only organizations that are explicitly responsible for innovation, making them the logical choice in creating linkages.

Linking with the University has been mentioned as a very imperative move; however the question still remained who needs to be the initiative taker. The university should be the epicenter of innovation by partnering up with the Central Bureau of Statistics and collecting data and conducting research. This was the main idea in the second round, because more respondents realized the capability, responsibility, and potential of working together with the university. “We should understand that the sources of innovation differs amongst services and technological.” “We should then focus on the most rewarding segment, as we have a big service industry and a small industrial one.” Proper understanding of these sources will support the development and produce a more effective policy. The university has most recently also taken the initiative for an innovation system like cooperation, called the K-Zone.

**Attracting MNE’s as innovators**
Respondents generally concluded that MNE’s also readjust market focus aside from the arguments from Schumpeter (1945). MNE’s can also take up the financial component that Curacao still misses to build the commercial part of innovation. Companies that were inquired reacted more on the commercial side, but argued that partnering in R&D will be done on a second mover basis and especially on testing prototypes. MNE’s are very relevant as a component, but it is too premature to attract them. It is most efficient that each of the current components to create linkages with MNE’s on their own for individual matters.

**CONCLUSION**

**Curacao and Innovation Policy**
The primary conclusion to take from this thesis is that an innovation policy would indeed have positive economic effects on Curacao. All of the respondents signal that the failure to implement an overall policy for innovation has hampered the creative/innovative development of system components, and the economic gains thereof. This is greatly attributed to the federal system in the Netherlands Antilles where economic policy is dealt with at two levels, and many uncertainties remained on which level was responsible for an overall policy. The political sphere has involved itself too much in non effective ways on segmented policy making rather than an overall policy. This problem will be partly solved after Curacao exits the federal system and becomes autonomous part of the Kingdom; the political sphere will still be the biggest challenge to bridge.

Another pressing issue is that there is no overall innovation policy which organizes all components which would formalize an innovation system. The island being subordinate to a federal level, having itself another layer of policy institutions, forms a barrier in its development. Responsibilities are divided amongst the government levels and are sometimes forgotten or omitted. The current programs related to innovation offer also few incentives towards innovation.

Another main issue with innovation in Curacao is that of mentality, as society is quite risk averse and resistant to change. This, combined with the mentality of individualism hinders innovation greatly on the island. Attitudes and mentality towards innovation have not been dealt with, allowing for the market to demand innovations, which also stalled innovative character of firms. Startups are also less oriented to foreign markets and see no need or potential in innovating. Like the quote at the beginning of the chapter signals, Curacaouans are unique peoples. Government should thus create uncommon environments to stimulate their creativity.

Furthermore little research is being done in order to pull the population, and firms, to innovate. Many components of an innovation system can be observed in Curacao, but are however not encouraged to form linkages with each other. Findings suggest solving this by formally assigning innovation tasks to components and providing effective incentives to formalize linkages.
**Recommendations**

Government should most definitely embrace innovation policy and take a more aggressive role of innovation in Curacao. Specific industries should be chosen, but a balance should be found between diversification and intensification. ICT would be a good industry to consider as a starting point. Government should also create missing components, like financing. This can be done by merging existing components and by reassigning responsibilities, as startups are hindered by fragmentation amongst components and government departments. Incentives will be more important on the long run, to maintain the innovative drive.

The innovation policy should thus encompass an overhaul of education, gearing it towards a responsible risk loving attitude and capacities for the desired sectors where innovation will be supported. The new education system should be made to fit the sector(s) government chooses to focus on, leaving still room for other promising sectors (financial service innovation). It is also important to start doing research on the societal perception, views and issues with innovation. The areas of trust and honesty, relevant human components for innovation should also be studied to facilitate the wider implementation of the innovation policy. This is why it is important to group research entities like FIDE and FPI and other (Social) Science Studies organizations into/at the University of Curacao to foster research.

In order to support innovation government should focus on creating the innovative culture which is responsibly risk loving. A way of doing this is to stimulate more “lower innovations” and creativity, therefore reducing this barrier for innovations which would have bigger impacts. Fundashon Negoshi Pikina is a very good example on how, on the short term, to develop creativity and entrepreneurship from early on in the education cycle.

The K-Zone initiative is a very good example of breaking the initiation, Government needs to follow, allowing for the system to start taking shape. Establishment of Public Laboratories and Research Institutes in basic science can also be effectuated at the University of Curacao. These labs should be assessed effectively, instead of looking at profits government should look at national indicators.

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**REFERENCES**


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**Annexes**

**Stakeholders overview**

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<th>Institution</th>
<th>Job</th>
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<tr>
<td>Ministry of Economic Dev.</td>
<td>Economic Policy</td>
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<tr>
<td>Innovation Center Curacao</td>
<td>Supporting and promoting innovation in businesses, research</td>
</tr>
<tr>
<td>Curacao Chamber of Commerce</td>
<td>Business registry, courses &amp; conferences, basic startup support</td>
</tr>
<tr>
<td>STIMUL-IT</td>
<td>Stimulating the use of IT</td>
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<tr>
<td>SEDECK</td>
<td>Curacao Small Business Development Center</td>
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<tr>
<td>ADECK</td>
<td>Association of Small Businesses</td>
</tr>
<tr>
<td>Korpodeko</td>
<td>Financing target specific SME projects and supporting social economic development of Curacao</td>
</tr>
<tr>
<td>OBNA</td>
<td>Financing target specific projects and supporting social economic development of the Netherlands Antilles</td>
</tr>
<tr>
<td>University of Curacao</td>
<td>Provides degree courses, research university</td>
</tr>
<tr>
<td>Fundashon Negoshi Pikiña</td>
<td>Educational program for all levels of education which stimulates creativity, innovation, and entrepreneurship</td>
</tr>
<tr>
<td>ASINA</td>
<td>Association of Industrialists of the Netherlands Antilles</td>
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Innovation Policy Brief
Cooperative public-private efforts to construct regulatory regimes that foster global competitiveness and domestic efficiency: The government needs to assess current stakeholders (c.q. Components) in the innovation system and direct the policy to industries that are relevant and desired for economic growth and development. This should be based on financial/economic data that should be provided by the CBS and studies in cooperation with the University. The plans of a knowledge economy chair and the knowledge society platform are perfect examples. Once this has been completed, Government should look at the education system and restructure it accordingly, decreasing risk averseness and promoting creativity. This should be done in a matter that creates rather specialist technical capacity, with room for creativity and diversification.

Government should also develop frameworks that facilitate innovation, such as (WTO friendly) tax benefits for R&D, tariff reductions etc. A major move should be to restructure components of the innovation system in order for them to create appropriate linkages towards the goals of the system. The creation of business centers, incubators and national laboratories are essential aspects to study when deciding on the restructuring of components. Public-Private partnerships should also be created to for investments in infrastructure pertaining to the innovation system. Government hereby stimulates the creation of linkages.

Relevant subsidy programs should focus on promising products and markets in order to loosely steer the international aspect. A subsidy system should also be placed strategically to support all phases of innovation within a firm. This will allow firms to get specialized support for the corresponding segment of innovation, this should also go hand in hand with advice on market focus etc. These subsidies should be developed in close cooperation with studies done by the University, Central Bureau of Statistics, Innovation Center, Chamber of Commerce etc.

The investment in higher education and research is of utmost importance, the University should aim to attract top class researchers and broaden its portfolio allowing also for transnational education, both for incoming and outgoing students. Higher education should become a very important component and is seen as the epicenter of innovation. It is thus interesting to start clustering components at or around the University, seeing the infrastructural changes and opportunities with regards to land. The system should also encompass a simple (!) evaluation system in order for it to be dynamic as opposed to time and market demand.

The Innovation Center of Curacao should get much more resources to facilitate innovation. In conjunction with that they should also have more tasks as do other innovation centers in successful peer countries, e.g. Taiwan, Singapore. The local companies that have potential to become globally competitive should be supported by this innovation system in order for the economy to become part of the global business chain and jump start activities.

Finally Government should institute specific components that are able to organize systems for Public-Private information sharing, entail in public-private partnerships/public venture capital with promising companies.