# AN EXAMINATION OF THE ENHANCEMENT OF TECHNOLOGICAL CAPABILITIES IN GLOBAL VALUE CHAINS

# A COMPARATIVE STUDY OF THE TUNA INDUSTRIES OF GHANA AND THAILAND

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# Abstract

This thesis is set against the narrative that African economies can advance their structural transformation agenda through the transfer of knowledge from foreign firms that is assumed to occur by participating in global value chains (GVCs). To investigate this proposition, I first conduct a critical literature review to construct an analytical framework that combines the technological capability, sectoral innovation system and GVC frameworks. I then discuss: 1) whether the knowledge transfer from multinational firms assumed to transpire in GVCs is sufficient to enhance the technological capabilities of their suppliers; and 2) whether and to what extent such capabilities are propagated and enhanced through linkage development. To investigate these questions empirically, a comparative case study of the tuna industries of Ghana and Thailand is undertaken based on the materials gathered during fieldwork in Ghana and secondary sources available for Thailand.

This thesis consists of ten chapters. Chapter 1 introduces a background debate, the research questions and the thesis structure. Chapters 2 and 3 present a review of the theoretical and empirical literatures respectively. An overview of the global tuna industry is presented in Chapter 4. Chapter 5 outlines the methodology followed in my case study. Chapter 6 examines the tuna industries of Ghana and Thailand, providing a background for my subsequent empirical analysis. Chapter 7 evaluates how Ghanaian and Thai tuna firms acquire technological capabilities to undergo upgrading whilst Chapter 8 assesses the extent of linkage development in the two countries. Chapter 9 broadens the analyses from the micro study of the tuna industry to meso and macro levels, followed by discussions on constraints facing Ghana in advancing its structural transformation agenda. In Chapter 10, I conclude my study by discussing my main arguments as well as some policy issues and areas requiring further study.

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# List of Abbreviations

| | |
|---|---|
| AGOA | African Growth and Opportunity Act |
| AGI | Association of Ghana Industries |
| BOI | Board of Investment |
| CMT | Cut Make Trim |
| CSR | Corporate Social Responsibility |
| EEZ | Exclusive Economic Zone |
| EOI | Export Oriented Industrialisation |
| EPA | Economic Partnership Agreement |
| EPZ | Export Processing Zone |
| EU | European Union |
| FADs | Fish Aggregating Devices |
| FDA | Food & Drugs Authority |
| FDI | Foreign Direct Investments |
| GCC | Global Commodity Chains |
| GDP | Gross Domestic Product |
| GEPA | Ghana Export Promotion Authority |
| GIPC | Ghana Investment Promotion Centre |
| GMP | Good Manufacturing Practice |
| GPN | Global Production Networks |
| GTA | Ghana Tuna Association |
| GVC | Global Value Chain |
| HACCP | Hazard Analysis Critical Control Point |
| H-D | Harrod - Domar |
| ICCAT | International Commission for the Conservation of Atlantic Tunas |
| ICT | Information and Communications Technology |
| ISI | Import-substitution Industrialisation |
| ISIC | International Standard Industrial Classification |
| MSC | Marine Conservation Society |
| NAFTA | North American Free Trade Agreement |
| NGO | Non-Governmental Organisation |
| ODM | Original Design Manufacturer |

| | |
|---|---|
| OEM | Original Equipment Manufacturer |
| PFC | Pioneer Food Cannery |
| R&D | Research and Development |
| RBI | Resource-based Industrialisation |
| RFMO | Regional Fisheries Management Organisation |
| RMU | Regional Maritime University |
| SAP | Structural Adjustment Programme |
| TAC | Total Allowable Catches |
| TFPA | Thai Food Processors Association |
| TTIA | Thai Tuna Industry Association |
| UNCLOS | United Nations Convention on the Law of the Sea |

# Chapter One
## Introduction

### 1.0 Introduction

In this chapter, I lay the foundation for the analysis I carry out in the rest of this study. This involves establishing the justification of my research, identifying the research questions (and proffering my hypotheses), demonstrating what gap this study fills in the literature and detailing how the chapters are organised to investigate the research questions.

The motivation driving this study is to find out whether the structural transformation (economic development) of sub-Saharan African economies can be promoted through their engagement in global value chains (GVCs). This is based on the prevailing narrative that African economies can hasten their economic development through the transfer of knowledge and technology that occurs when they insert themselves into GVCs to produce goods.

Given the strong association of economic development with innovation (see Chapter 2), the central question of this study relates to determining how innovation occurs in firms engaged in GVCs. Whilst this relationship between GVCs and innovation is often taken as a given, I show that a proper understanding of the way they interact has significant but different implications for policy than is currently proffered in mainstream studies. To enable me to investigate this broad question, I develop two sub-questions which I examine based on my empirical study. The first relates to establishing how firms in the tuna industries of Ghana and Thailand acquire the technological capabilities that are necessary for them to upgrade in their chains.[1] This exercise establishes the specific role of GVC participation in the technological capability-building paradigm. Secondly, I examine how the skills and knowledge that the firms acquire are transmitted economy-wide through linkages.

My research, despite being a micro-study, provides some relevant insight into the larger issue of structural transformation in African countries particularly in respect of how firms enhance their technological capabilities.

[1] In this study, I use upgrading in the chain to represent innovation.

The rest of this chapter is organised as follows: in Section 1.1, I elaborate on the rationale for this study where I trace how the development model for many African countries, which received high commendation in the 2000s, failed. I also show how the conventional wisdom regarding the ability for GVCs to stimulate economic development in developing countries emerged. In Section 1.2, I discuss my research questions and provide my hypothesis for each question. Furthermore, I demonstrate the basis upon which I have selected the tuna GVC for my empirical analysis. I conclude this section by identifying the unique contribution of my work to the existing literature.

Section 1.3 is where I provide information on how this study has been organised to meet its objectives by indicating what each chapter contains. Section 1.4 contains the conclusions for this chapter.

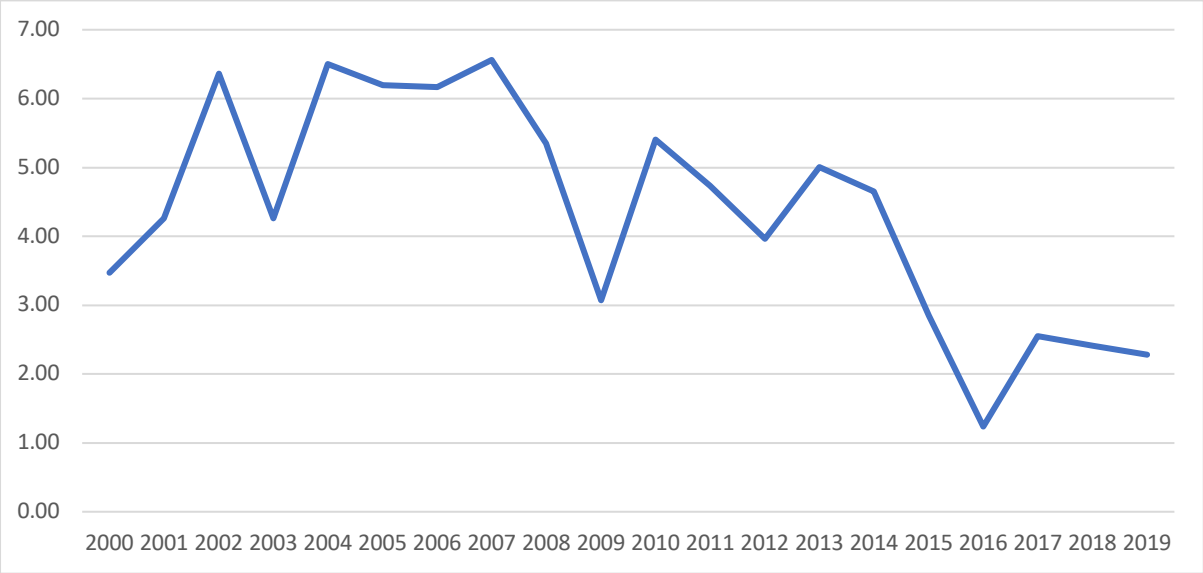
### 1.1 Rationale for This Study

As I indicated in the previous section, my motivation for this study is the structural transformation of sub-Saharan African countries. This concern has become relevant after African countries realised that the high growth rates they experienced for over a decade since the year 2000 were not only unsustainable but also had limited effect on their socio-economic development (Taylor, 2016).

Until its recent collapse, this period of notable growth performance by sub-Saharan African economies, represented by the catchphrase, 'Africa Rising' (Beresford, 2016; Taylor, 2016), was viewed as a vindication of the neoliberal policies that had been foisted on them by the mainstream economic thinking (Mkandawire, 2014). The conventional argument was that the success of these countries was derived from "*better governance and economic policies*" (Taylor, 2016, p. 8).

This story of the rise and decline in growth rates of sub-Saharan African economies is captured in Figure 1 below. The chart, which shows the annual growth rate of sub-Saharan Africa, indicates that in general, the economies grew steadily from 2000 to 2014 with average growth rate around 5% during the period. However, as indicated in the graph, the impressive growth results have declined since 2015 with the growth rate averaging about 2%.

Figure 1 Annual GDP Growth Rate of sub-Saharan Africa

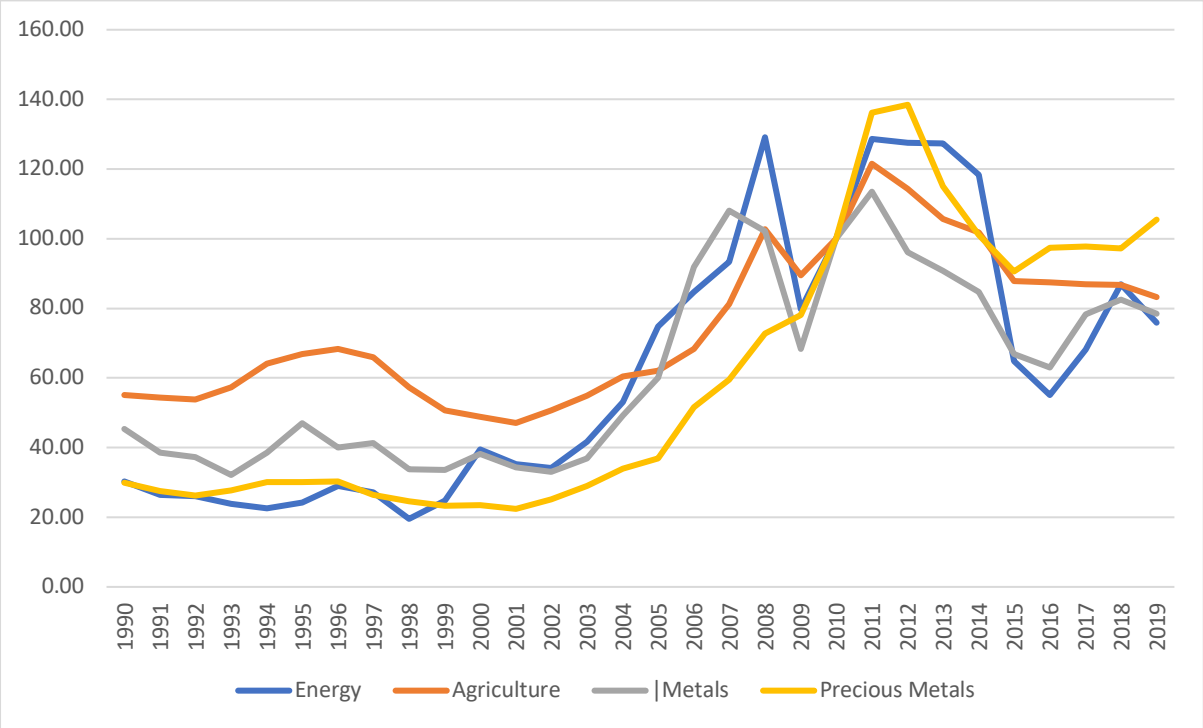



Source: Author's illustration using data from World Bank (2021)

Taylor (2016) refutes the idea that 'Africa Rising' was a consequence of good policies and suggests that it was mainly attributable to high prices of the primary exports of many African economies. This view is shared by Mkandawire (2014) who states that "*the expansion in export earnings has been based on increased prices rather than increased production of export commodities*" (p. 173). In fact, Mkandawire (2014) and Taylor (2016) suggest that the 'Africa Rising' period was not accompanied by the type of structural changes that is usually expected of countries undergoing industrialisation.

Mkandawire (2014) and Taylor (2016)'s postulation that the 'Africa Rising' period was triggered by improvements in the export prices of primary goods is supported by the data in Figure 2 below, which indicates how commodity prices have generally risen since the beginning of the 2000s, suffering a steep decline in 2009, making an immediate recovery and falling in 2015 even though they are currently recording modest improvements. Comparing Figures 1 and 2, growth rates and the commodity export prices of the countries in the region have generally been moving in the same direction

Figure 2 Some Selected Commodity Price Indices

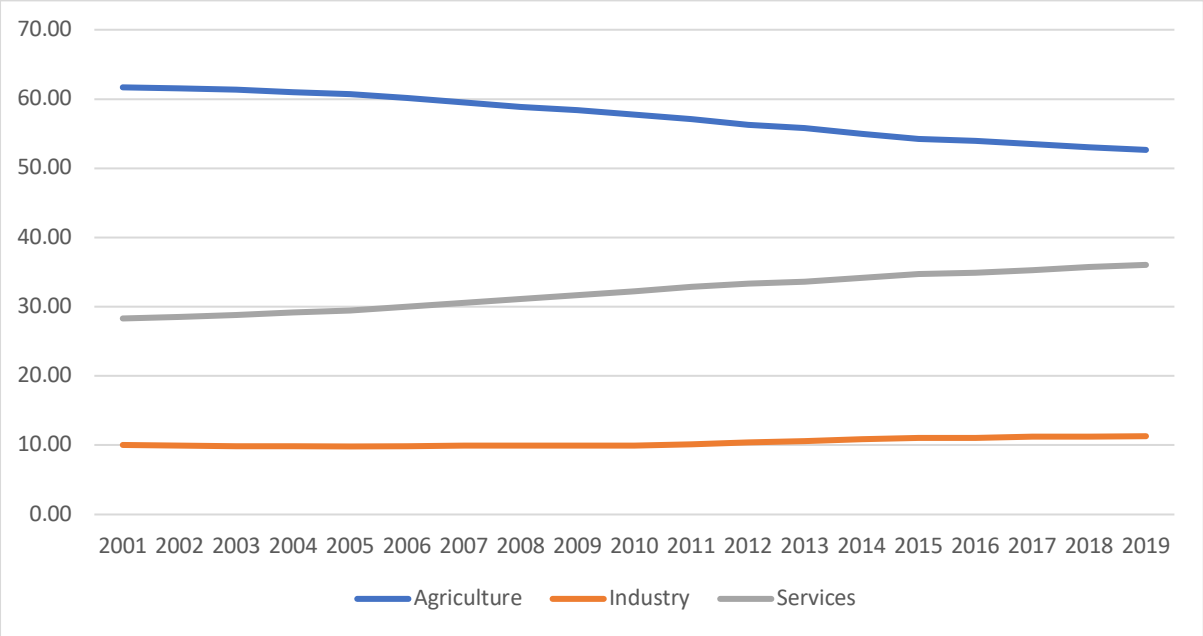



Source: Author's illustration using data from World Bank (2020)

The foregoing analysis diminishes the potency of the 'Africa Rising' narrative. Mkandawire (2014) argues that the brief period of growth by African economies should be viewed as a response to the many years of stifled growth due to the structural adjustment programmes rather than a strong march towards sustainable economic development. Taylor (2016) adds that if anything, the 'Africa Rising' episode has entrenched Africa's underdevelopment as it has stalled efforts at economic diversification due to the reliance on commodity exports.

The socio-economic impact of the 'Africa Rising' episode can be verified by examining its influence on employment and this is shown in Figure 3 below. The chart shows that the strong growth posted by African economies in the 2000s had minimal impact on employment in industry as it has remained fairly stable throughout the period. The data also indicates that agriculture's share of employment has been falling over time whilst services' share has been moving in the opposite direction.

Figure 3 Share of Employment by Sector in sub-Saharan Africa




Source: Author's illustration using data from World Bank (2021).

The growth in the services sector's share of employment can be explained by the rise of informal service activities in many African economies following their economic liberalisation (McMillan and Rodrik, 2011).

It is within this context that I situate my study. My research is inspired by Stiglitz and Greenwald's (2014) '*Creating a Learning Society*' book which underscores the notion that Africa's underdevelopment is directly related to the knowledge deficit it suffers compared to more prosperous nations. Stiglitz and Greenwald (2014) suggest that in order to have an economy that promotes the development of knowledge or ideas, it is not just the policies that specifically target innovation that are essential but also the integration of all government policies. This is especially important as policies that may be thought of as being supportive of economic development may actually be obstructive with regards to the promotion of learning in an economy (Stiglitz and Greenwald, 2014).

With these ideas of learning firmly in mind, I examine some modern debates over Africa's structural transformation drive. The discourse on Africa's economic transformation is taking place in an environment that is different from the 1970s and 1980s. McMillan and Rodrik (2011), as well as Wade (2003) mention that globalisation has affected the way developing countries can industrialise since they cannot resort to some of the trade strategies that today's

developed countries used to protect their local industries at the time of their industrialisation. Therefore, the current discourse on Africa's growth model must consider how African economies can develop with strategies that are attuned to the current times.

One proposal has come from Lin (2011), who considers the economic transformation process as a gradual one that involves countries exploring areas closer to their comparative advantage and using them to accumulate the skills required to move to more complex sectors. He sums up his arguments with the following statement:

> *"Economic development is a process of continuous industrial and technological upgrading in which any country, regardless of its level of development, can succeed if it develops industries that are consistent with its comparative advantage, determined by its endowment structure. The secret winning formula for developing countries is to exploit the latecomer advantage by building up industries that are growing dynamically in more advanced countries that have endowment structures similar to theirs. By following carefully selected lead countries, latecomers can emulate the leader-follower, flying geese pattern that has served well all successfully catching-up economies since the eighteenth century"* (Lin 2011. p. 3)

He also points out that African economies are in the position to receive manufacturing industries that are exiting China due to growing costs. This, in his view, will quicken industrialisation in Africa.

This argument regarding the shifting of production locations in the global supply of goods is presented in a formal framework called global value chains (GVCs) by Gereffi et al (2005). The framework, whose antecedent was the global commodity chain (GCC) model (Bair, 2009; Kaplinsky, 2013), suggests that the low wage advantage in developing countries prompts the transfer of the labour intensive jobs from international firms abroad to their suppliers in developing countries (Kaplinsky, 2013). The relocation of these jobs to developing countries can then substitute local efforts at building manufacturing industries from the ground up, particularly with the outdated import substitution industrialisation (ISI) policy tools (Baldwin, 2011, 2012)[2].

[2] Baldwin (2011, 2012) does not situate his analysis within the GVC framework but rather a supply chain model. However, I find some of his arguments applicable to the GVC model. See Chapter 2 for more.

In this new paradigm (the GVC framework), local suppliers in developing countries may receive knowledge and technology to boost their capabilities when they interact with their foreign clients (international firms) in the chain (Gereffi et al., 2005). The type and extent of knowledge transfer will be mediated by the nature of the interaction of the two parties in the chain (Gereffi et al., 2005). According to the authors, there exists five forms of engagements, which they call governance structures (Gereffi et al., 2005). The most intensive form of engagement occurs in the hierarchical chain where the local supplier is a subsidiary of the international firm and the latter wields complete control over the former (Gereffi et al., 2005). The least intensive form of interaction occurs in market chains where the local supplier exercises total control and independence and sells its product on the market to potential buyers (Gereffi et al., 2005). The governance structures are elaborated in Chapter 2.

The policy implication of the GVC framework for developing countries is quite intuitive. They have to deepen their participation in GVCs by removing impediments to investments by international firms (Baldwin, 2011, 2012). Put differently, Baldwin is suggesting that attempts by African governments to intervene significantly in their markets to prop up their manufacturing sector could be counterproductive as they may inhibit their ability to join GVCs.

My study explores these arguments in light of Stiglitz and Greenwald (2014)'s emphasis on the importance of learning in the economy.[3]

## 1.2 Research Problem

A comprehensive study of how learning is promoted in an entire economy is a thorough undertaking that is beyond the scope of this study. Therefore, in assessing the common argument that plugging into GVCs improves structural transformation in Africa, I examine how firms that are involved in global chains undertake innovation. The objective behind this is that it allows me to verify the extent to which GVCs alone promote learning and the acquisition of capabilities in firms based in Africa. This in turn feeds into the broader analysis of structural transformation (or the promotion of learning) in the entire economy. To this end, I have developed one main research question and two sub-questions, which are outlined below.

[3] Apart from Stiglitz and Greenwald (2014), other scholars including Lundvall (2007) have highlighted the importance of learning in the economy. A review of some of these studies is undertaken in Chapter 2.

### a. Research questions

i. What factors promote innovation in GVCs?

This is the main question of this thesis. It is based on the prevailing narrative that when developing countries enter GVCs, knowledge transfer is induced, which leads to innovation. My objective is therefore to examine this mechanical process to verify its validity. Although some empirical studies have investigated different aspects of this conventional argument (for example upgrading in GVCs), they do not sufficiently utilise an analytical framework that incorporates the technological capability, learning and GVC literatures. Indeed, Morrison et al. (2008) highlight this gap in their review of the existing literature and call for GVC studies to combine these frameworks (they specifically refer to the GVC and technological capability models, but my study adopts a GVC-technological capability-innovation system approach since I find that to be more suitable). Therefore, this question provokes the development of a novel framework based on the literature covering the concepts. The analytical framework thus developed then serves as the basis for my empirical analysis.

The hypothesis I develop for this question is:

*The mainstream argument that GVCs can be the main instigators of innovation in developing countries is overstated as it does not take account of the nature of technological capability-building in firms as well as the importance of domestic innovation strategies of the countries, which may rather be the catalysts for successful insertion into GVCs.*

My proposition is influenced by Lall (1992) who questions the common assertion that foreign investments induce technology transfer; a process often viewed as automatic. He also underscores how this popular assertion wrongly ignores or undermines domestic innovation efforts. As hinted by Morrison et al. (2008), GVCs simply rehash this same argument of foreign investments boosting local innovation, albeit, using a more sophisticated model. The prevailing argument that GVCs engender innovation assumes that integration into GVCs cannot be deleterious to a firm's learning process (Morrison et al., 2008). On the contrary, I am convinced that the way a firm integrates into a global chain affects its learning and subsequent innovation efforts. Furthermore, the manner of integration of the firm is influenced by its existing capabilities as well as a favourable macro-environment.

In order to answer this broad question, two sub-questions have been developed to tackle different aspects of this GVC-innovation paradigm to shed more light on it.

ii. How do tuna canneries upgrade in global value chains?

I apply a sophisticated analytical framework that combines the technological capability, innovation system and GVC literatures to an empirical study on tuna firms that are involved in GVCs. The objective is to assess the way the firms learn including their various sources of knowledge, to bolster their technological capabilities to undertake upgrading in the chain. By so doing, I can determine whether and the extent to which GVCs solely promote learning and capability building in the firm. In part (b) of this section, I set out the reasons for choosing the tuna value chain.

The hypothesis I postulate for this question is indicated below:

*Knowledge from international firms in GVCs is not sufficient to promote upgrading in (tuna) firms. Local sources of knowledge are important for the development of the technological capabilities of firms.*

My hypothesis is influenced by the work of Lall (1992) where he stresses that the reliance on foreign knowledge and technology should not be a substitute for the local development of a country's innovation base. By extending his arguments to the GVC framework, I posit that the domestic innovation framework of the developing country is influential in its ability to undergo upgrading in the chain.

iii. What are the linkages that form between the tuna industry and the local economy when the tuna canneries join GVCs?

This question ensures that the discussion over how firms undergo innovation in GVCs is nested within a broader analysis of development, particularly since the virtues of the GVC model as a development framework have been extolled in mainstream circles. Therefore, if GVCs are touted as development models for African countries, then they must be able to spur economy-wide linkages. This can be verified through the examination of linkages to ascertain whether

firms that partake in GVCs form enclave industries. Linkages also imply the transferability of skills or knowledge to the rest of the economy (this is expanded in Chapter 2 under horizontal linkages) which feeds to the broader issue of innovation in the economy.

I hypothesise that:

*GVCs cannot induce linkages in the local economies of developing countries by themselves. Developing countries must adopt local strategies to encourage linkage formation with industries engaged in GVCs.*

This postulation is grounded in my belief that the GVC framework does not adequately incorporate local linkages into the model and therefore it does not have much to say about the process. In addition, I extend Lall (1992)'s argument on the importance of developing countries boosting their own innovation to indicate that countries must also adopt their own strategies to engender the formation of linkages in the local economy.

### b. Why canned tuna?

I now comment briefly on the reasons why I have chosen the canned tuna value chain for my empirical analysis. Before I outline the basis for selecting the canned tuna GVC, I first discuss why I have settled on Ghana. The choice of Ghana is influenced by two main factors: 1) the practicality of organising PhD research in a familiar environment (my home country) due to constraints of time and logistics and 2) Ghana's common depiction as one of the African economies at the crossroads of its development drive, after experiencing a slowdown of the 'Africa Rising' agenda.

The choice of the tuna value chain is not arbitrary but based on an adaptation of one of the methods proposed by GIZ and UNIDO (2015), where the country's export products and their destinations are examined to identify the GVCs its firms operate in, and the positions they occupy in those chains. Therefore, for my analysis, where the export products end up in mature economies, it implies that those product chains are GVCs and the form of the product, such as raw materials or (semi) finished goods, indicate whether the country appears at the bottom or at the manufacturing stage of the chain respectively (GIZ and UNIDO, 2015).

Based on this, I examined Ghana's export basket in 2017 to identify the main export products. Whilst it is possible that the composition of the basket (or the relative importance of the products) can vary from year to year, my analysis of Ghana's main exports since 2015 shows that even though the distribution of the basket according to products has changed a few times, in general the major export items of Ghana have remained the same. I have chosen the list for 2017 for the purpose of illustration and this is presented in Table 1 below.

Table 1 Main Export Products of Ghana 2017 ($ billion)

| Product | Value of exports | Value of imports | Main Export Markets | Main Import Markets |
|---|---|---|---|---|
| Pearls, precious stones, metals, coins, etc | 5.9 | 0.17 | India, Switzerland, South Africa, UAE | China, South Africa, USA, Ethiopia |
| Mineral fuels, oils, distillation products, etc | 3.6 | 0.30 | China, Canada, Netherlands, USA | UK, Italy, UAE, USA |
| Cocoa and cocoa preparations | 2.4 | 3.2 | Netherlands, Malaysia, Brazil, Germany | Italy, Belgium, Malaysia, South Africa |
| Edible fruit, nuts, peel of citrus fruit, melons | 0.41 | 0.01 | Vietnam, India, UK, Netherlands | South Africa, France, Netherlands, Egypt |
| Plastics and articles thereof | 0.37 | 0.47 | Burkina Faso, Togo, Mali, Cote D'Ivoire | China, Saudi Arabia, USA, India |
| Wood and articles of wood, wood charcoal | 0.19 | 0.02 | India, Niger, Turkey, China | China, USA, Canada, Spain |
| Animal, vegetable fats and oils, cleavage products | 0.19 | 0.34 | Senegal, Malaysia, Niger, Netherlands | Malaysia, Cote d'Ivoire, Netherlands, Indonesia |
| Ores, slag and ash | 0.19 | 0.02 | China, Ukraine, Germany, India | Japan, France, Brazil, Togo |
| Meat, fish and seafood food preparations | 0.14 | 0.04 | UK, France, Germany, Netherlands | China, Morocco, Brazil, France |
| Salt, sulphur, earth, stone, plaster, lime and cement | 0.09 | 0.98 | Togo, Burkina Faso, Mali | Spain, Turkey, Korea |

Source: United Nations (2020 using The International Trade in Goods based on UN Comtrade Data Visualization)

As stated earlier, the products that are exported to developed markets suggest that those are GVCs that Ghana operates in. Therefore, from Table 1, this includes minerals (pearls, precious stones, metals, coins), mineral fuels, cocoa and cocoa products, fruits and meat and fish and seafood preparations. Out of this, I focus on the manufactured products since they imply that Ghana operates at a higher position in those chains as opposed to being stuck at the bottom, merely supplying primary commodities. More importantly, operating in manufacturing GVCs suggests that the Ghanaian firms possess more sophisticated skills than those producing raw materials. This allows me to examine how the manufacturing firms have deepened their technological capabilities to operate at higher levels in GVCs. The data in Table 1 indicates

that it is only the cocoa preparations and seafood food preparations that are manufacturing GVCs.

Given the broad nature of these categories, I turn to data on Ghana's non-traditional exports (Table 2 below) to get a breakdown.[4] The table shows that the cocoa preparations are semi-finished products (cocoa paste and cocoa powder) (Ghana Export Promotion Authority, n.d) whilst the main processed seafood product is canned tuna. Therefore, I can postulate that Ghana operates at a higher level in the canned tuna chain than in the cocoa chain. Based on this, the canned tuna GVC is selected for my analysis.

Table 2 Main Non-traditional Exports of Ghana 2017 ($ million)

| Product | Value |
|---|---|
| Cocoa paste | 458.90 |
| Cocoa powder | 378.2 |
| Cashew nuts (in-shell) | 263 |
| Canned tuna | 149.9 |
| Articles of plastics | 129.4 |
| Natural rubber sheets | 88.6 |
| Aluminium plates, sheets and coil | 67.9 |
| Shea (karite) oil | 66.2 |
| Fresh or chilled tunas | 57.7 |
| Cut fruits | 56.8 |

Source: Ghana Export Promotion Authority (2019)

The method I choose for my empirical study is a comparative analysis where I compare Ghana's canned tuna chain with that of Thailand, which is the dominant canned tuna producer and exporter globally (The Asia Foundation and ILO, 2015). Thailand is also useful because it is a middle income country (World Bank, 2011) that has risen to become the dominant tuna producer (The Asia Foundation and ILO, 2015) and will therefore provide important lessons on how its tuna firms developed their capabilities.

### c. Contribution to research

[4] The non-traditional exports include every export commodity apart from "*cocoa beans, lumber and logs, unprocessed gold and other minerals and electricity*" (Export and Import Act 1995 cited in Ghana Export Promotion Authority, n.d, p. Foreward)

My work combines the GVC, learning (innovation systems) and technological capability frameworks. Most of the studies I have sighted so far that come close to this undertaking tend to explicitly combine only two out of these three frameworks and therefore my work is an important contribution to the literature. In addition, although several GVC studies look at how the framework affects development in developing countries, such analyses are often done outside a learning and technological capability paradigm.

Furthermore, since I investigate an agro-processing GVC, I add to the existing knowledge on agro-based industrialisation from a GVC perspective. I note that many empirical studies on GVCs in Africa tend to be in agriculture or in the case of the manufacturing sector, textiles. By examining an agro-processing industry, particularly one related to fisheries, my work adds to an under-researched area in the empirical GVC literature relating to African economies in general and Ghana in particular.[5] Finally, my work considers the issue of local linkages, which the GVC framework is largely silent on.

### 1.3 Organization of the Study

I organise my study into ten chapters. In chapter two, I carry out an extensive review of the theoretical literature where I cover studies ranging from topics on economic growth, innovation systems, technological capabilities, linkages and GVCs. In Chapter 3, I conduct an empirical literature on the broad themes identified in Chapter 2 with particular focus on GVCs, including an assessment on how they are organised, the main players and their interactions with each other as well as the way they exercise their power to maintain their positions in the chain. The theoretical and empirical literature reviews presented in Chapters 2 and 3 provide the analytical framework that I use for my empirical study.

Chapters 4, 5 and 6 provide the background to the analysis of my empirical results. In Chapter 4, I present an overview of global tuna production and trade. I provide the history of canned tuna production and detail how it is currently organised, including the major producing, exporting and consuming nations. I also discuss the main players in the chain and how they influence one another to maintain or improve their positions in the chain.

[5] I have sighted two major studies on the tuna industry in Ghana (Asiedu et al., 2015 and Drury O'Neill, 2013) but their focus is not primarily on issues of learning and capability-building.

In Chapter 5, I discuss the methodology I adopt for my empirical study. I justify the research methods I use and indicate their weakness. I also give the reader more information on the fieldwork I conducted, including a brief fieldwork report that highlights the main challenges encountered and how they were solved.

In Chapter 6, I delve specifically into the tuna industries of Ghana and Thailand and discuss their origin, structure and some information on the leading tuna firms operating in the countries. I also compare the way the tuna firms in Ghana and Thailand are integrated into GVCs as well as the governance structure of their respective chains.

Chapter 7 deliberates on the sectoral innovation system of the tuna firms in Ghana and Thailand and how they acquire their technological capabilities to undertake upgrading in the chain. The analysis is based on my fieldwork in Ghana and secondary data available for Thailand. Here, I identify the various sources of the technological knowledge that the Ghanaian and Thai tuna firms depend on to enhance their capabilities. This allows me to highlight the unique contribution of GVCs in fostering the technological capabilities of the tuna firms in Ghana and Thailand. I also compare the upgrading outcomes of the tuna firms in both Ghana and Thailand that result from the capability-building process. This also gives an indication of the depth of knowledge transfer that occurs in the tuna firms. I do not only focus on economic upgrading concepts but also merge considerations relating to social upgrading with my analysis to see the effect of GVC participation on fragile workers. The analysis I carry out in Chapter 7 enables me to answer my second research question.

In Chapter 8, I examine the linkages that emerge from the tuna industry with the rest of the economy to verify if participation in GVCs spurs the emergence or development of other local industries. I also want to see whether such linkages occur spontaneously and how they can be deepened. In addition, I am interested in the cross-application of the knowledge or technological capabilities gained in the tuna industry to other sectors in the economy. The analysis undertaken in this chapter is geared towards answering the third research question.

Chapter 9 extends my analysis beyond the tuna industries to the broader manufacturing sectors of Ghana and Thailand. The aim is to demonstrate that the observations I make about the tuna industries of both countries apply to their respective manufacturing sectors. I enrich this exercise by incorporating into my analysis a study conducted on various manufacturing firms

in Ghana by Fu et al. (2014) where they identify the different sources of knowledge the firms rely on to undertake innovation. This provides a strong overview of the manufacturing sector of Ghana. Furthermore, I discuss the macro-environment within which Ghana's structural transformation agenda is taking place with reference to Nissanke (2019)'s macroeconomic framework for advancing a structural transformation agenda.

In Chapter 10, I state my conclusions drawn from this study. I also highlight some policy implications and indicate themes that can be researched further.

### 1.4 Conclusion

In this chapter, I have discussed my rationale for embarking on this study. I have stated that Stiglitz and Greenwald (2014)'s essay on the 'learning economy' sparked my interest in examining if the GVC framework, currently being pushed as a development model for Africa, can engender the type of learning and innovation required to narrow the knowledge gap between Africa and the industrialised nations. Even though I do not undertake a macro-analysis of learning and innovation of the entire economy, my sectoral analysis provides important insight into how firms learn and acquire their technological capabilities to undertake innovation. I have shown that my selection of tuna manufacturing for my empirical analysis is justified because it is the main GVC that Ghana operates in at a high position.

My research questions are three-fold: the first is the overarching one which aims to establish the true connection between innovation in firms and global value chains. The second research question assesses how tuna firms undertake learning to enhance their capabilities to upgrade in the GVC. This allows me to determine whether and how GVCs can be important conduits for knowledge transfer and upgrading in tuna firms as has been suggested in mainstream thinking. The third research question pertains to linkages where I determine if the emergence of a GVC in a country triggers the development of other domestic industries.

I have asserted that this study enriches the existing literature in this field by sharpening the focus on the relationship between innovation and GVCs of developing countries. It also adds to the literature on agro-processing GVCs in Africa through a case study on Ghana. Finally, my incorporation of domestic linkages into the GVC analysis sheds light on an area which has been overlooked in many GVC studies.

# Chapter Two

## Theoretical Literature Review

### 2.0 Introduction

In the previous chapter, I suggested that a proper understanding of the way the innovation and GVC frameworks are integrated influences the policy issues that arise when developing countries participate in global chains. I also argued that the popular assertion that GVC participation propels structural transformation in Africa was based on a particular understanding of how firms in these chains learn and build up their capabilities to innovate. My first research question, looking at how innovation occurs within GVCs, motivates the development of an analytical framework which demonstrates how firms in GVCs learn, promote their capabilities and undergo innovation. This analytical framework is established in this chapter and deepened in Chapter 3, for use in my empirical analysis later.

In developing this analytical framework, I distinguish between what I loosely call the 'mainstream approach', which represents the conventional understanding of how firms in GVCs acquire knowledge and enhance their capabilities to innovate, and an alternative approach, which in my view, is the true reflection of the way innovation works in firms involved in GVCs. I first trace how innovation has emerged as the main determinant of economic progress in countries by reviewing some selected growth theories.[6] The mainstream models I examine, mainly those associated with growth theories, provide a theoretical basis for the conventional wisdom on the GVC-innovation nexus (what I call the 'mainstream approach'). In particular, I highlight three main themes – learning, capability-building and innovation – which, when applied to the GVC framework, imply that foreign firms in GVCs are the main source of knowledge for firms in developing countries.

I contrast the mainstream approach with an alternative one proposed by the evolutionary school, particularly with regards to the three themes identified earlier. I also indicate that as a result of the emphasis placed by the evolutionary school on institutional arrangements, scholars have turned to the innovation system models, which merge the evolutionary approach with the

[6] As noted in Romer (1993), innovation has been used synonymously with words like "*technological change"*, "*invention"* and "*entrepreneurship"* in reference to "*activities that increased the stock of intangible knowledge or ideas*" (p. 549), therefore, to avoid confusion, I mainly use the term 'innovation' throughout this chapter except where I am directly quoting an author.

institutional economics framework as their theoretical foundation (Nelson and Nelson, 2002). Specifically, I discuss the sectoral innovation system model, since that is the framework I use for my empirical work. I demonstrate that GVCs can be incorporated into this framework because the foreign firms potentially serve as one (but not necessarily the most important as suggested by the mainstream approach) of the knowledge-transfer agents within the system. With specific regards to models on organisational learning and technological capabilities, I turn to Kim (1998) and Lall (1992) respectively.

Although proponents of the national innovation system theories highlight the developmental aspects of the model, I believe that they are not sufficiently developed for macro-level economic analyses. Therefore, to understand the macro conditions for an economy-wide development agenda, I turn to two recent works: 1) the social capability approach advocated by Chang and Andreoni (2019), which discusses institutional prerequisites for industrialisation; and 2) the structural transformation framework of Nissanke (2019), which provides insight into the appropriate macroeconomic environments that foster structural transformation. In my view, the second paper can be linked to the discussion on innovation systems as it provides a framework where the various development policies, aimed at improving the innovation system of a country, can be harmonised and pursued in a logical manner.

I examine the GVC framework in detail and contrast it with other types of global chains including global commodity chains (GCC) and the global production networks (GPN). I delve into the governance structures of GVCs, showing how they influence the interactions between the foreign lead firms and their suppliers from developing countries. This leads to my discussion on the knowledge transfer mechanisms in the chain. I also examine upgrading processes (including social upgrading) that take place in the chain and relate them to the governance structures to show how the former is influenced by the latter. Furthermore, I explore issues of income distribution in global chains, which is not sufficiently examined in the formal GVC framework.

This chapter is organised as follows: In Section 2.1, in setting the scene on the centrality of innovation in the economic development process, I trace the evolution of the concept of development from the early growth models that emphasise capital accumulation to those that stress that innovation is the determinant for economic progress. Here, I contrast the mainstream approach to innovation with the one advanced by the evolutionary school. I then segue to the

concept of innovation systems, demonstrating how it is underpinned by the evolutionary and institutional models.

In Section 2.2, I focus specifically on the sectoral innovation systems model. I examine the concepts of learning, capability-building and linkages within this framework. I look at how firms gain knowledge through learning from agents in the system in order to promote their capabilities. Since the concept of linkages is commonly associated with the diffusion of innovation and skills throughout the economy, it constitutes an important element in my analytical framework for this study.

Section 2.3 looks at two frameworks that allow for analysing institutions as well as the favourable macro-environment for development. These include the social capability and structural transformation models although I focus more on the latter, since I adopt it as the overall policy discussion framework for this study.

Section 2.4 presents a critical literature review that examines global value chains and development, including literature on global commodity chains and global production networks. I also examine concepts such as upgrading, knowledge transfer and income distribution in relation to GVCs. This provides a foundation for my empirical study in subsequent chapters.

The concluding remarks for this chapter are presented in Section 2.5.

## 2.1 Determinants of Economic Progress

### a. Mainstream growth theories

#### i. Initial focus on capital accumulation

Development scholars originally associated economic development with economic growth (Todaro and Smith, 2015). Two important studies (jointly called the Harrod-Domar (H-D) model), undertaken by Domar (1946) and Harrod (1939), have been commonly regarded as sparking the beginning of the post-world war growth theories (Hagemann, 2009). According to Hagemann (2009), the two studies sought "*to extend Keynes's analysis into the long run by considering under what conditions a growing economy could reali[s]e full-capacity*

*utili[s]ation and full employment*" (p. 67). This achievement of full capacity and full employment would result in equilibrium (Hagemann, 2009). The fundamental argument of the H-D model was that, in order to induce growth that ensured full employment, countries had to invest at a specific rate annually whilst ensuring that this process kept at pace with population growth (Hagemann, 2009). However, the methods used by both authors to reach this conclusion implied that the economy was consistently volatile (Hagemann, 2009; Solow, 1956, 1988), a situation described succinctly by Solow (1956) as follows:

> *"The characteristic and powerful conclusion of the Harrod-Domar line of thought is that even for the long run the economic system is at best balanced on a knife-edge of equilibrium growth. Were the magnitudes of the key parameters – the savings ratio, the capital-output ratio, the rate of increase of the labor force – to slip ever so slightly from dead center, the consequences would be either growing unemployment or prolonged inflation"* (Solow, 1956, p. 65)

Solow (1956) argues that this problem originates from the assumptions used in constructing the H-D model. Specifically, he believes that if it were possible to swap labour with capital in the production process, then "*the knife-edge notion of unstable balance seems to go*" (p. 65).

Before moving away from the capital accumulation models to examine Solow's arguments, I assess Lewis (1954) model which, according to him, was better suited for countries with "*unlimited supply of labour*" (p. 401). He argued that excess workers, based in the subsistence sector, which was the "*part of the economy which [was] not using reproducible capital*" (p. 407), made no contributions to the sector's productivity.

The capitalist sector was therefore, according to the author, "*the part of the economy which [used] reproducible capital and [paid] capitalists for the use thereof*" (p. 407). Economic growth resulted from the owners of capital ploughing back their profits into the firm leading to an increase in activities, thereby prompting the employment of the excess workers in the subsistence sector (Lewis, 1954). He opined that this cycle was repeated until all the unused workers in the subsistence sector had been taken up by the capitalist sector.

### ii. Shift to innovation

Robert Solow's seminal study in 1956 marked an important turn in the mainstream growth theory literature as the focus on capital accumulation shifted to innovation as the determinant of economic growth. As has been indicated earlier, he criticised the implication of the conclusions of the H-D model and advocated for a change in the "*assumption that production takes place under conditions of fixed proportions*" (Solow, 1956, p. 65).

He argued that once the assumption was changed, with production occurring under constant returns to scale, the economy could reach a stable position where any departure only led to readjustments and a restoration of stability, thereby eliminating the '*knife-edge*' situation. However, under diminishing returns, innovation (he called it technological progress) could induce continual expansion of the economy (Solow, 1988).

Whilst Solow's emphasis on the role of innovation in the growth process was useful, his arguments were undermined by the fact that his neoclassical model did not shed light on how innovation could be sparked in the economy (Todaro and Smith, 2015). This triggered the emergence of the endogenous growth models seeking to correct this anomaly (Todaro and Smith, 2015). One of the influential works in this regard is Arrow (1962). He argues that the underlying cause of innovation is learning, which occurs subconsciously in workers during their normal operations on the job. In his own words:

> *"[L]earning is the product of experience. Learning can only take place through the attempt to solve a problem and therefore only takes place during activity"* (Arrow, 1962, p. 155).

More specifically, he describes the process of innovation by stating that

> *"technical change in general can be ascribed to experience, that is the very activity of production which gives rise to problems for which favo[u]rable responses are selected over time"* (Arrow, 1962, p. 156)

Arrow's emphasis on learning will go on to have a significant influence in the literature on innovation. Stiglitz and Greenwald (2014), for example, indicate that their work was driven by his analysis on learning.

Other significant studies within the endogenous theory tradition include Romer (1986), who argues that "*long run growth is driven primarily by the accumulation of knowledge by forward-*

*looking, profit-maximi[s]ing agents*" (Romer, 1986, p. 1003). In his model, knowledge, which embodies capital, experiences "*increasing marginal productivity*" which means it can expand in perpetuity (Romer, 1986, p. 1003). This then makes production to exhibit "*increasing returns*" as opposed to the "*decreasing returns*" espoused in the mainstream models at the time (Romer, 1986, p. 1003). As he puts it:

> *"[T]he key feature in the reversal of the standard results about growth is the assumption of increasing rather than decreasing marginal productivity of the intangible capital good knowledge"* (Romer, 1986, p. 1004)

According to Hussein and Thirlwall (2000), however, many endogenous models strive to differentiate themselves from the mainstream capital accumulation frameworks, but, in reality, they are unable to fully distinguish their production function from the constant returns assumption of the H-D framework, essentially making their arguments the same. Again, as noted by Todaro and Smith (2015), even though the endogenous models approach the issue of growth differently from the neoclassical models, they still "*bear some structural resemblance*" (p. 160). Given these connections between the neoclassical and endogenous models of growth, I broadly refer to them collectively as the mainstream models in this study.

Some of the underlying assumptions of the mainstream models, which have been attacked by their prominent critics, as demonstrated in Nelson (2011) and Nelson and Winter (1982), include: a) profit maximization being the main goal for producers; b) the ability of agents to be sufficiently aware of all options and their consequences, thereby leading to well informed choices; and 3) the attainability of equilibrium in the economy.

### b. Evolutionary school of thought

#### i. Approach to innovation

According to Nelson and Winter (1982), their starting point is Schumpeter's ideas on innovation. Schumpeter (2010) argues that economic development results from innovation in the form of "*new consumers' goods, the new methods of production or transportation, the new markets, the new form of industrial organi[s]ation that capitalist enterprise creates*" (p. 73). He indicates that innovation leads to constant changes in the economy since they quickly render

current products and methods obsolete in a process called "*creative destruction*" (Schumpeter, 2010, p. 73).

He further suggests that the evolutionary nature of capitalism requires any analysis of the system to be based on observations spanning extended periods instead of using data from just a short period. According to him, mainstream economics do not have this long term perspective on issues, as their preoccupation is often with "*how capitalism administers existing structures, whereas the relevant problem is how it creates and destroys them*" (Schumpeter, 2010, p. 74).

The evolutionary school that follows Schumpeter's ideas also challenges the features of the economic agents and the way the economy works in the mainstream models (Nelson, 2011; Nelson and Winter, 1982). The basic outline of their argument as laid out by Nelson and Winter (1982) is summed up in their own words below:

> *"Firms at any time are viewed as possessing various capabilities, procedures, and decision rules that determine what they do given external conditions. They also engage in various "search" operations whereby they discover, consider, and evaluate possible changes in their ways of doing things. Firms whose decision rules are profitable, given the market environment, expand; those firms that are unprofitable contract"* (Nelson and Winter, 1982, pp. 206–207)

According to Nelson (2011), an important concept borrowed from Schumpeter's arguments, which happens to be a critical pillar of the evolutionary approach, is the idea of "*uncertainty*" (p. 5), which suggests that the process of innovation is hit-and-miss. Nelson (2011) opines that given the uncertainty associated with the outcomes of their decisions, firms tend to depend on "*routines*" (p. 2). Nelson and Nelson (2002) describe a routine as "*a way of doing something, a course of action*" (p. 267). The authors further add that

> *"almost always there will be a set of understandings or beliefs associated with a particular routine, which explicates or rationali[s]es why it is appropriate in a particular context, and often, which provides an explanation of why and just how it works"* (Nelson and Nelson, 2002, p. 267)

For Nelson and Nelson (2002), the routines are analogous to the concept of institutions. Given the inter-dependence of institutions and the technologies firms produce, the authors indicate that the evolutionary approach must be integrated into the institutional economics frameworks. They suggest that the evolutionary tradition pays attention to "*technologies*" (p. 267) but not much on institutions, even though they are aware of the latter's influence in the process of innovation. The institutional economics on the other hand stresses the concept of institutions but not much on the underlying "*technology and technological change*" they affect (Nelson and Nelson, 2002 p. 267). This conundrum has provoked the necessity to merge the evolutionary and institutional economics and this can be achieved with the innovation system models (Nelson and Nelson, 2002).

### ii. Innovation Systems

Edquist (1997) questions the conventional thinking that firm innovation only results from research and development (R&D) activities, since, in reality, they form just one outlet for knowledge transfer. Carlsson et al. (2002) suggest that the innovation system framework essentially examines the various modes of knowledge dissemination that occurs during the process of innovation in a firm. In their own words:

> *"[O]ne of the most important types of relationships in innovation systems involves technology transfer and acquisition, some of which takes place via markets, some via non-market interaction. Indeed, one could argue that technology transfer is the core activity in an innovation system*" (Carlsson et al., 2002, p. 234)[7]

Lundvall (2016) adds that learning, which underpins innovation activities in the innovation system, is not only an economy-wide feature but also "*a social activity that involves interaction between people*" (p. 86). This implies that the process of knowledge transfer encompasses different entities within the economy exchanging knowledge with each other (Edquist, 1997); a phenomenon that leads Lundvall (2016) to denote learning as being "*interactive"* (p. 86). Edquist (1997) mentions some of the entities affecting knowledge transfer as "*other firms (suppliers, customers, competitors) but also universities, research institutes, investment banks, schools, government ministries, etc.*" (p. 2).

[7] The authors use the term technology transfer which undoubtedly contains knowledge. For my purpose, I stress on the transfer of knowledge.

Following Lundvall's (2007) argument that "*technical innovation is a cumulative and path-dependent process*" (p. 101) as well as Edquist's (1997) insistence that it (innovation) does not just depend on "*economic…but also … institutional, organizational, social and political factors*" (p. 17), the innovation systems approach appears to be a solid framework for analysing innovation since, according to Nelson and Nelson (2002), it is rooted in the evolutionary and institutional economics traditions.

Authors like Archibugi et al. (1999), Edquist (1997) and Nelson and Nelson (2002), indicate that innovation systems can occur at the level of sectors, the country, regions and specific technologies. Studying innovation systems at the national level proves challenging since, according to Lundvall (2016), there is the problem of incorporating agents that lie outside the system, like foreign firms, who can be important conduits for knowledge transfer. According to Lundvall (2016), multinational companies today "*are weakening their ties to their home countries while beginning to spread their innovative activities and to 'source' different national systems of innovation*" (p. 88). Whilst this problem may undermine the utility of a national innovation system and may favour a shift towards supranational frameworks, the author argues that an advantage of the national innovation systems is that the agents are affected by common "*institutional setup*" (p. 87).

The approach I adopt for this study is the sectoral innovation system, since it allows me to narrow the focus or scope of my analysis. According to Malerba (2002), the sectoral innovation system is defined as

> *"a set of new and established products for specific use and the set of agents carrying out market and non-market interactions for the creation, production and sale of those products"* (Malerba, 2002, p. 250).

He also identifies some of the agents in this system that Edquist (1997) lists but adds "*trade unions and technical and industry associations*" (Malerba, 2002, p. 250). I include multinational firms in the list of agents in the sectoral system and identify the GVC as the mechanism through which they transfer knowledge to local firms. By so doing, I can combine the literature on innovation and GVCs.

The sectoral innovation system serves as an alternative to the mainstream approach to innovation with regards to how firms in developing countries, particularly those involved in GVCs, boost their capabilities. I now turn to discuss how learning and capability-building occurs in the model.

### 2.2 Learning, Capability-Building and Linkages in the Sectoral Innovation System

Although most studies on innovation systems highlight the importance of learning, they do not delve deep into the mechanism by which it takes place or the process of building the capabilities of firms. These studies are often silent on the types or functions of the capabilities that are developed. Therefore, I fall on the learning and technological capability literature to fill this gap. Also, since "*the function of an innovation system is to generate, diffuse and utilize technology*" (Carlsson et al., 2002, p. 235), I will rely on the concept of linkages, developed by Hirschman (1958), to examine how technology or innovation is diffused in the economy.

#### a. Learning

With regards to learning, I adopt Kim (1998)'s organisational learning framework for this research. A key variable in his model is absorptive capacity; a concept previously put forward by Cohen and Levinthal (1990). Cohen and Levinthal (1990) had hinted that the knowledge that comes into the firm can only be used by the workers if they have the capabilities to do so. They referred to these capabilities as the "*absorptive capacity"* of the individual or the firm (p. 128). The authors stressed that this absorptive capacity was influenced by the firm's existing stock of knowledge, which they called *"prior knowledge"* (p. 128). According to the authors, absorptive capacity can be accumulated through training programmes, experiences from firm operations and even R&D.

Kim (1998) indicates that the 'prior knowledge' an individual or firm possesses consists mainly of tacit knowledge. New knowledge comes into the firm in either a tacit or explicit form, which the worker then transforms into a format suitable for use (Kim, 1998). The simplified outline of his model is as follows: when the worker receives explicit information, like that contained in a manual or book, it is transformed into tacit knowledge for use through a process called "*internali[s]ation"* (Kim, 1998, p. 508). Where the new knowledge is tacit, like those that originate from conversations with colleagues, it results in a buildup of the tacit knowledge of

the worker in a process called "*sociali[s]ation"* (Kim, 1998, p. 508). If the worker receives tacit knowledge and it must be codified (transformed into explicit knowledge) before being used, the process is called "*externali[s]ation"* (Kim, 1998, p. 508). Finally, explicit knowledge coming into the firm may be added by the worker to the existing explicit knowledge and this process is called "*combination"* (Kim, 1998, p. 508).

### b. Capability-building

For this study, I focus on Lall's (1992) model of technological capabilities on the basis that it is extensively used in the empirical literature. In addition, Nelson (2011) suggests that Lall's ideas are closely aligned with the evolutionary framework. This makes his framework suitable for incorporation into the discussion on innovation systems.

Lall (1992) distinguishes between "*firm-level technological capabilities*" (p. 166) and "*national technological capabilities*" (p. 169). He categorises the firm-level technological capabilities according to their "*functions and degree of complexity*" (p. 166). For my study, I concentrate on his taxonomy of firm-level technological capabilities based on their functions especially as they are relatively easier to observe and measure. He identifies three of them – investment, production and linkage. The investment capabilities, according to him, are used by the firm to create new establishments. These capabilities will be useful for the firm to examine the propriety of an investment, meet all regulatory requirements, raise capital, meet its human resource needs, and be able to identify and choose the suitable technology for operation (see Lall, 1992, p. 168). The production capabilities allow the firm to undertake its core operations which includes various activities in the production process such as the operation of the technology and R&D activities (see Lall, 1992, p. 168). The linkage capabilities facilitate the interaction between the firm and external actors like suppliers, regulatory agencies and consultants (see Lall, 1992, p. 168).

In this study, I have included another type of capability, namely market capabilities, to the set of technological capabilities I examine. This is based on Lall's (1991) paper, discussing the challenges that developing countries face when entering developed markets. Strictly speaking, activities under market capabilities overlap with the other types of capabilities he identifies in his 1992 paper. For example, issues related to the quality of the product or its design are affected by production capabilities (Lall, 1991). In addition, his work suggests that linkage

capabilities can cover the firm's interactions with foreign traders or distributors, advertisers and retailers (Lall, 1991). Despite this, I make market capabilities a distinct technological capability in my research in order to adequately investigate the enhancement of these skills in developing countries that operate in GVCs.

### c. Linkages

I now turn to examine how knowledge, capabilities and innovation that are acquired or developed in one industry are spread to the rest of the economy.[8] The main framework on linkages I use is by Hirschman (1977) who categorises them as "*production, consumption and fiscal"* linkages. This study mainly focuses on production linkages which have an advantage of being easy to identify (Hirschman 1977).

He notes that industries can be connected through fiscal linkages when the state taxes one industry and uses the revenue to support others. He indicates that this is a way of connecting enclave activities to the rest of the economy although the strength of this linkage is influenced by the state's ability to make sound spending decisions with the tax revenue (Hirschman, 1977). The author also asserts that the consumption linkage is established when workers in an industry use their incomes to consume products from other industries. He suggests that even when the consumption is on imports, over time, it can spur the emergence of local competitors.

His concept of production linkages is elaborated in an earlier study in 1958. He argues that as a result of production linkages, the creation of one industry stimulates the emergence of others and this undermines the argument that countries must establish the entire local supply chain of a product simultaneously to spur industrialisation. In fact, he asserts that linkages may be sparked by foreign firms. This postulation is relevant for this study as I examine how integration into GVCs can foster linkage formation within the local economy.

The production linkages can be "*forward",* that is, the creation of one firm prompts the establishment of another who uses the output of the original firm as its input in production, or "*backward",* where a new firm is created to provide inputs to the initial firm (Hirschman, 1958).

[8] Lall (1992) associates the economy-wide spread of knowledge from the firm with linkage capabilities but in my study, I specifically discuss this under Hirschman's framework, which I find more comprehensive.

Hirschman further avers that the formation of linkages is fostered more extensively in the manufacturing sector than in the primary sector and this makes manufacturing suitable for driving the industrialisation agenda of a developing country. This is because the supply chain of industries in the former tends to be longer than those in the latter, whose output are usually utilised after production instead of being processed further (Hirschman, 1958).

Hirschman's framework does not adequately account for interactions between firms that are not involved in the same supply chain (even though he undertakes a brief discussion). Scholars such as Morris et al. (2011) submit that ideas developed in one firm can be applied to industries that may not be linked to a firm via forward or backward linkages. This type of linkage is called horizontal linkages (Morris et al., 2011).

Even though my research is geared towards examining sectoral performances in innovation (including learning, capability-building and linkages), as I stated in Chapter 1, my overall motivation is the economy-wide structural transformation of African countries. With this background in mind, I situate my study within the broader development debate. For this purpose, I now turn to discuss two theses – Chang and Andreoni's (2019) social capability and Nissanke's (2019) structural transformation models – which are selected to evaluate macro-level conditions that promote industrialisation and structural transformation.

## 2.3 Institutional and Macroeconomic Conditions for Structural Transformation

### a. Creating institutional conditions for industrialisation

The social capability concept as propounded by Abramovitz (1986) sought to explain the differences in developmental outcomes between the rich and poor countries. Chang and Andreoni (2019) argue that Abramovitz's social capability idea accounts for those institutions often disregarded by the mainstream in their development models. Their approach can be associated with the evolutionary school, as evidenced in the following statement, since they also merge the concepts of (social) capabilities and institutions to account for development:

> *"The concept of social capability advances a powerful idea, namely that economic development is not simply a firm-level affair (or state endeavour), but rather is made possible by the development of various types of social*

> *capability encapsulated in specific types of institutions operating at different levels of the economic system and at its interstices (intermediate institutions) to coordinate productive activities"* (Chang and Andreoni, 2019, p. 423).

They demonstrate this concept by proposing a set of institutions that affect a country's capability to drive industrialisation – "*production, productive capabilities development, corporate governance, industrial finance, industrial change and restructuring and macroeconomic management for industrialisation"* (pp. 424 – 434).

They assert that overtime, production has been organised under different institutions – "*the factory system, the Taylorist system, the Fordist system, the lean production system, industrial districts and clusters and GVCs*" (pp. 425 – 426). It is their contention that even though some of these institutions of production belong to the past, firms in developing economies must still utilise them.

With regards to the institutions that enhance the productive capabilities of firms, the authors indicate that they can be stimulated from within the firm, such as its research activities or staff development programmes, or from outside the firm such as those by external research organisations. Another institution for industrialisation they consider relates to corporate governance. This is where they argue that industrialisation is boosted when firms have ownership structures that are not volatile, enabling them to undertake sustainable ventures. The authors also highlight the institutions for industrial financing, which they associate with the financial sector's capacity to support firms with deep and stable funding for industrialisation.

Under the institutions for industrial change and restructuring, they argue that as new technologies and industries emerge, the skills of workers must be updated in line with the changes in industry but the adaptability of workers to changing conditions can differ across sectors. According to them, workers may seek to protect their jobs by strongly opposing changes which may in turn negatively affect the country's industrialisation drive although this may be avoided if the uncertainty and insecurity they feel regarding their jobs are minimised. The final category of institutions for industrialisation they mention relates to the country's macroeconomic framework, which they imply must provide suitable conditions like low interest rates to foster the activities of firms.

## b. Creating macroeconomic conditions for structural transformation

### i. From structural change to structural transformation

Before I espouse Nissanke's (2019) framework, I will first show why it's necessary to focus my discussion on structural transformation rather than just sectoral structural change. The common association of structural transformation with structural change is rooted in observations that economic development of countries is usually accompanied by changes in the structure of the economy. Structural change suggests that as countries develop, agriculture's share of the economy shrinks with industry initially dominating economic activities and then services later becoming the most important sector (Nayyar, 2019). The treatment of the two terms, structural transformation and structural change, as the same thing can be evidenced by the definition of structural transformation of Herrendorf et al. (2014) as "*the reallocation of economic activity across three broad sectors (agriculture, manufacturing and services) that accompanies the process of modern economic growth*" (p. 857).

Before distinguishing between the two concepts, I expatiate on why industrialisation is widely regarded as the driver of economic development. From Lewis' (1954) framework, the capitalist sector (which can be associated with manufacturing) is able to expand in ways that the subsistence sector cannot and this allows the former to have a greater capacity to employ workers than the former. At the same time, innovation is expected to be greater in the manufacturing sector, since it utilises more capital compared to the primary sector (UNCTAD, 2016). Hirschman (1958) also argues that manufacturing is associated with deep linkage formation. Perhaps, the strongest case often made for industrialisation is that it sets the country on a path of sustainable growth as products command higher prices due to value addition and prices are more stable compared to those of primary commodities (Morris and Fessehaie, 2014; UNCTAD, 2016).

There have been intense debates over the type of industrialisation which must be practiced by developing countries. The earlier debates over import-substitution industrialisation strategies have taken a backseat as it has become increasingly clear that those methods of industrialisation are not applicable today due to globalisation (Nelson, 2011; Wade, 2003). This situation has led to a flurry of ideas of how industrialisation can take place today within the constraints posed by globalisation.

As I mentioned in Chapter 1, one suggestion proffered by Lin (2011) is that developing countries can use their comparative advantage as a platform to enhance their capabilities and accumulate resources to shift into more sophisticated manufacturing activities that require complex skills. The author's suggestion downplays the importance of ISI policies since most developing countries have their comparative advantage in primary exports. He opines in another forum that even if developing countries were to venture into areas they do not have comparative advantage in, they must engage in those with moderate skill-intensity (Lin and Chang, 2009).

According to Lall (1994), although there appears to be a general recognition over the severe limitations of the neoliberal agenda, which promoted a non-interventionist approach to industrial policy, there has not been a strong shift by the mainstream to an industrial policy that recognises a deeper role for the state. In other words, the author argues that whilst the mainstream acknowledges that some form of state intervention is required to spur industrialisation, its proposal is still timid and not a complete departure or reversal of the neoliberal agenda. The author reviews a study by the World Bank which evaluates the role of the East Asian states in stimulating their economic performance. Lall (1994) indicates that whilst the study, which he considers as an appraisal by the World Bank of its earlier neoliberal stance, diagnoses aspects of the East Asian development story appropriately, it gets it wrong in its conclusions. He summarises his assertion this way:

> *"The study concludes that some interventions, especially in capital markets, may have helped some of the larger, leading industriali[s]ers (Japan, Korea and Taiwan). Selective promotion in general [is] nonetheless not really effective in meeting its objectives, cannot be taken by other governments without the skills and impartiality of the East Asians, and is not in any case an open policy option now. Thus, it ends up with soothing noises for the Bank: governments should undertake "market-friendly" interventions and get economic "fundamentals" right.* (Lall, 1994 p. 646)

There are also models that indicate that the primary sector can drive industrialisation. These are commonly referred to as resource-based industrialisation (RBI) models. These models such as the one espoused by Morris and Fessehaie (2014) argue that the primary sector can engender

innovation and linkages which makes it just as suitable as manufacturing to promote industrialisation.

However, structural change is an insufficient concept because it ignores several facets of development. Nayyar (2019) argues that "*structural transformation is a multidimensional phenomenon*" (p. 92) which suggests that structural change is only one of the dimensions (Nissanke, 2019; Nübler, 2014).[9] Nissanke's (2019) definition of structural transformation, which I adopt for my study, provides an in-depth view of its different facets. She defines structural transformation as

> *"a development process involving changes in multiple dimensions of a socio-economic system, including its production matrix, social structure, institutional setting and its relationship with the natural environment"* (Nissanke, 2019, p. 104).

### ii. Macroeconomic policy environments for structural transformation

I argue that Nissanke's (2019) analysis of macroeconomic policy environments for structural transformation can be integrated with Chang and Andreoni's (2019) approach since it makes provision for how institutions (and social capabilities) can be improved in an economy. The thrust of Nissanke's (2019) argument is that development must be holistic and will be achieved through the effective coordination of not only all the development policies but also a harmonisation of macroeconomic and development policies. This synchronisation of macroeconomic and development policies will require developing countries to shift away from the focus on price stability towards a more development-oriented objective for their macroeconomic framework (Nissanke, 2019). Her model critically assesses the current paradigm, where private sector investments are expected to drive development under a macroeconomic environment of price stability.

Nissanke insists that such private sector investments in developing countries are unlikely to be sustained given the weak foundation of fragile infrastructure and poor institutions. It is in this vein that she proposes sustained public investments that crowds-in private investment towards

[9] Nayyar (2019) however adds that over a long time span, structural change is the central element of structural transformation.

strengthening the pillars of development. Mainstream analysis implies that a surge in government expenditure to build up these pillars will induce macroeconomic instability, but Nissanke argues that if the macroeconomic approach is fundamentally altered to support these investments, macroeconomic instability will be averted. She also argues against suggestions that developing countries lack the institutional capacity to advance such a programme by indicating that the institutional capacity does not develop in a vacuum but results from deliberate investments, which, in turn, feed back into the country's capability to conduct suitable macroeconomic policies.

She proposes a 5-point agenda aimed at this macroeconomic-development policy nexus which are briefly mentioned here. First, she advocates for deliberate effort at "*changing Africa's revealed comparative advantage*" through increased but sustainable public expenditure (Nissanke, 2019, p. 108). She also urges the promulgation of a "*long-term development planning framework*" to anchor macroeconomic and development policies in the countries and foster their harmonisation (Nissanke, 2019, p. 109).

Third, she proposes achieving macroeconomic stability whilst increasing public investments by enhancing aggregate supply. Fourth, she encourages the identification and reliance on more sustainable funding sources for developing countries to promote their development instead of depending on aid or the foreign capital market which provides steep and volatile financing costs. Finally, she argues that the huge public investments in the economy must be underpinned by fiscal responsibility This, according to her, can be promoted by aligning expenditures with a robust long term revenue raising plan.

So far, I have showed how innovation in developing countries can be examined using the innovation system model. I have also indicated that the model is insufficient for a macro-level analysis of development and have looked at other frameworks such as social capability and structural transformation models.

In the next section, I review a set of the GVC literature in more detail. Since my empirical study will be on critically examining the conventional argument that the GVC-centered development model on its own fosters the enhancement of capabilities of firms in developing countries and hence their innovation, this critical literature review of the different approaches

to the GVC-development nexus will help guide the empirical analyses presented in subsequent chapters.

## 2.4 Global Value Chains and Development

### a. Types of global chains

In the literature, the terms supply chains, value chains and production networks are often used interchangeably although their analytical frameworks differ. I adopt the GVC framework for my study because of its extensive use in the literature and the depth of its analytical structure. I however cover the other related concepts in this section to show how they differ and relate to each other.

#### i. Global supply chains

There are two main traditions associated with the analysis of global production: the ideas emerging from economics and those offered by sociologists (Inomata, 2017). Some economists argue that the new form of international production and trade is a modified version of the new trade theory (Inomata, 2017).

Before the new trade theory emerged, the dominant Heckscher-Ohlin trade theory argued that trade, which was based on a country's factor endowments, mainly occurred in the form of inter-industry exchanges between developing countries, producing primary products, and the developed countries, supplying finished goods (Inomata, 2017; Krugman, 2009; Neary, 2009). However, what was observed was the rapid rise in trade between countries with similar factor endowments and income levels (Inomata, 2017; Krugman, 2009; Neary, 2009) and the nature of this exchange was more of "*intra-industry rather than inter-industry trade*" (Neary, 2009, p. 219).

Today, trade in intermediate products has been boosted between firms across international boundaries and this has prompted the emergence of what some scholars call the *"new* new trade theory" (Inomata, 2017, p. 15). Krugman and Venables (1995) attempt to explain the geographical shift in manufacturing towards developing countries by suggesting that the phenomenon corresponds to the stage in globalisation where "*transportation and*

*communication"* (p. 859) costs have declined significantly to the point where the firms in developed countries are motivated to relocate their production activities to developing countries to take advantage of low wages whilst coordinating activities from their base.

Krugman and Venables (1995)'s argument is expanded by Baldwin (2011, 2012) who uses the term global supply chains to describe the global production and trade in intermediate products. Baldwin (2012) suggests that the offshoring decisions of multinational firms will be influenced by the interplay of what he calls "*direct costs and separation costs*" (p. 13). According to him, the direct costs involve wages whilst the separation costs include transport costs.

The implications for economic development of global supply chains are discernable. Baldwin (2012) advocates for a "*join-instead-of-build*" (p. 9) industrialisation agenda for developing countries, where they plug into existing manufacturing chains and specialise instead of expending resources to create entire industries locally. In his own words:

> *"[T]here is no need for the time-consuming nurturing of an industrial base and investment in a broad range of technical competencies. The multinational arrives and production starts in little more than the time it takes to build the factory"* (Baldwin, 2012, p. 26).

### ii. Global commodity chains

I now pivot to the development of the global chain literature in the sociology discipline. The global value chain model was developed within the sociology discipline (Inomata, 2017) and the model widely referred to today in most studies is the one by Gereffi et al (2005).

However, the antecedent of the GVC framework is the global commodity chain (GCC) model developed by Gary Gereffi (Bair, 2009; Kaplinsky, 2013). The GCC model in turn emerged out of the world systems framework (Bair, 2009).[10] Hopkins et al. (1987) argued at the time that the capitalist system was the basis of the world-system that "*takes the form of a world economy*" (p. 764). They suggested that the world economy was "*a set of integrated production processes linked in a continuing (through evolving) social division of labor which*

[10] Gibbon (2000) on the other hand suggests that GCCs were borne out of the dependency theories.

*fundamentally determine social behavior (or social action) within its arena (boundaries) over time*" (p. 764). In other words, "*one economy but multiple states*" (Hopkins and Wallerstein, 1977, p. 127).

By blurring the lines between a national and global economy, Hopkins and Wallerstein (1977) were able to use their concept of a world economy to undermine the prevailing notion that countries first started trading in their domestic market before venturing into external markets. They used the idea of commodity chains to demonstrate how this conventional notion of development was wrong. According to the authors, a commodity chain for any good would encompass all the activities involved in its production, including "*the prior transformations, raw materials, the transportation mechanisms, the labo[u]r input into each material processes [and] the food inputs into the labo[u]r*" (p. 128).

The authors indicated that multiple countries can be involved in the commodity chain for one product, and they can influence their role or activity in the commodity chain. Gereffi and Korzeniewicz (1994) built upon this idea of commodity chains, suggesting that they "[*linked] households, enterprises, and states to one another within the world-economy*" (p. 2).

According to Bair (2009), the major differences between the GCC and the world systems theory are the stronger emphasis of the GCC model on: 1) how the strategies of firms shape these chains and 2) the developmental implications for countries.

In setting out the framework for his model, Gereffi (1994) first identifies the elements of GCCs as – "*input-output structure, territoriality, governance structure"* (pp. 96-97) and later includes *"an institutional framework*" (Gereffi, 1995. p. 113). The input-output structure relates to "*a set of products and services linked together in a sequence of value-adding economic activities*" (Gereffi 1994. p. 97). Territoriality looks at "*spatial dispersion or concentration of production and distribution networks*" (Gereffi 1994. p. 97) whilst the governance structure considers the "*authority and power relationships that determine how financial, material, and human resources are allocated and flow within a chain*" (Gereffi 1994. p. 97). The institutional framework covers "*how local, national, and international conditions and policies shape the globali[s]ation process at each stage in the chain*" (Gereffi, 1995. p. 113).

Gereffi (1994) recognised two forms of governance structures – the "*buyer driven chain"* and the "*producer driven chain"* (p. 97). According to him, in the buyer-driven chains, the lead firm, often a retailer, had no history in the direct production of the product and contracted suppliers to produce their brands. He associated these chains with labour-intensive industries such as garments and shoe manufacturing.

He suggested that the producer driven chains were composed of manufacturers who transferred certain production activities that were previously being conducted in-house to firms in developing countries. This, according to him, was more common in the capital-intensive industries. In addition, he finds that ISI strategies are more conducive for the producer-driven chains, whilst export oriented industrialisation (EOI) initiatives were suited for buyer-driven chains.[11]

Gereffi (1994) detected the state to have a reduced role in the economy with its main preoccupation being promoting measures to encourage deeper integration of the country into global chains since the industrialisation process would be stimulated by the lead firms in those chains. This effectively unifies the GCC framework with the global supply chain framework of Baldwin since the policy implications of both frameworks are the same.

The weaknesses of the GCC framework have been comprehensively discussed in the literature. For example, Gibbon (2001) believes that the governance structure in the GCC model is insufficient to capture the nature of all the types of lead firms controlling global chains. In particular, he alludes to primary commodity chains whose lead firms tend to be trading companies and given the importance of such chains to developing countries, the inability of the GCC framework to include them not only exposes its bias towards manufacturing but also cast doubts over its relevance for developing countries.

Additionally, Sturgeon (2008) opines that in reality, the two governance structures overlap since the lead firms in both chains operate in the same way, especially as those in producer driven chains now concentrate on coordination of their chains and outsource most of the other components of production. What this means is that the GCC framework is incapable of fully accounting for the different types of global chains (Sturgeon, 2008). Gibbon et al. (2008) also

[11] For a deeper analysis on these types of industrialisation strategies, see Schmitz (1984).

point out that whilst the governance structure describes the relations between the lead firm and its direct supplier, it is unable to do the same for the suppliers that appear in lower positions in the chain.

Kaplinsky (2015) proposes a global chain model for primary commodities where he employs a different taxonomy for the governance structures – "*vertically specialised and additive GVCs"* (p. 3).[12] He avers that in vertically specialized chains such as many manufacturing industries, firms at different stages of the chain can undertake production at the same time. This differs from the case of additive chains, where the production process of one firm only commences after the successful supply of an intermediate product by another firm (Kaplinsky, 2015). According to him, this is mainly a feature of resource sectors.

### iii. Global value chains

The GVC model has emerged in response to the shortcomings of the GCC model (Bair, 2008; Kaplinsky, 2013). According to Kaplinsky (2013), central to the outsourcing decisions of lead firms is the issue of rents. Kaplinsky (2015) identifies three types of rents – "*resource", "innovation"* (or better still "*endogenous"*) and *"exogenous"* rents (p. 5). According to him, the *resource rents* are generated from the firm's access to natural resources such as raw materials. The *endogenous rents* on the other hand are deliberately created by the firm through research and innovation whilst the *exogenous rents* emanate from factors such as infrastructure and skilled labour, which are as a result of the environment the firm operates in (Kaplinsky, 2015). Based on this exposition by Kaplinsky (2015), it can be argued that for firms in Africa, one can expect resource rents to be the most dominant form of rents, given the availability of natural resources and limited R&D conducted by firms whilst for those in developed countries, the endogenous and even exogenous rents are likely to be more important to the firm than resource rents.

The usefulness of this concept to the GVC framework is that firms are likely to specialise in activities that enhance their rents; that is their "*core competence*" (Kaplinsky, 2013, p. 9). Thus, lead firms are expected to focus on the research, design, sales, marketing and after sales

[12] He uses the term global value chains instead of GCCs.

segments of the chain and allow their suppliers to undertake the raw material production and assembly of the products (Baldwin, 2012).

One of the important contributions of the GVC framework developed by Gereffi et al (2005) is the expanded governance structure (Kaplinsky, 2013). Bair (2008) and Gibbon et al. (2008) indicate that it is not only the qualitative and quantitative changes in the governance structures in the GVC framework that distinguishes it from the GCC model but also the fundamental meaning of the concept (governance) in both frameworks. According to Gibbon et al. (2008), whilst the GCC model focuses on how the lead firms control the whole chain, the GVC model pays attention to interactions between the lead firm and its direct supplier (first-tier supplier).[13] The authors imply that not all the interactions between the lead firm and its first tier supplier in the GVC framework involves the exertion of power by the former on the latter, in contrast to the GCC model where under both governance structures, the lead firm controls the suppliers.

In constructing their GVC model, Gereffi and his colleagues utilise the "*transactions costs economics, production networks, technological capability* and *firm-level learning"* literatures (Gereffi et al., 2005 (p. 78); see also Sturgeon, 2008). They assert that the governance structures are influenced by three factors – "*complexity of transactions, the ability to codify transactions and the capabilities of the supply-base"* (Gereffi et al., 2005, p. 78). The authors argue that these factors are not exhaustive as relevant variables like history and institutions are not included for the sake of simplicity (Gereffi et al., 2005, p. 82).

Therefore, if for example, the transaction is straightforward, can be systematised and the suppliers have adequate skills, the lead firm has limited control over its supplier (Gereffi et al., 2005). There can be an extreme case of this called the *market* governance structure where the supplier acts independently and does not cater to the unique needs of any buyer (Gereffi et al., 2005). At the other extreme is the situation where the supplier's capabilities are weak, and the transaction is highly sophisticated and does not give in easily to systematisation. This corresponds to a *hierarchical* governance structure where the lead firm has full control over the supplier and the latter acts according to the dictates of the former (Gereffi et al., 2005). In between the two extreme governance structures are those showing varying degrees of lead firm

[13] The first level supplier is the main supplier that deals directly with the firm and in some cases manages other suppliers down the chain.

control owing to differences in supplier capabilities and sophistication of transactions (Gereffi et al., 2005).

In the *modular* governance structure, for example, the supplier works under very limited supervision from its lead firm due to the possession of adequate skills even though it may be contractually bound to supply to that lead firm (Gereffi et al., 2005). Modular chains differ from market chains because although in both cases, the supplier possesses significant capabilities to produce without control from the lead firm, under the latter, the exchange between the firm and its buyers occurs only at the market but with the former, the relationship between suppliers and lead firms is closer (Gereffi et al., 2005). Under the *relational* governance structure, the supplier possesses some skills but engages in a deeper exchange of information with its buyer compared to the modular governance structure (Gereffi et al., 2005). For *captive* governance structures, supplier capabilities are weak and transactions are sophisticated and cannot be systematised easily leading to greater influence over the supplier by the lead firm (Gereffi et al., 2005). The major difference between this governance structure and the hierarchical one is that the supplier remains an independent entity in the captive chain unlike the case of the hierarchical chain where it's a subsidiary (Gereffi et al., 2005).

### iv. Global production networks

Henderson et al. (2002), who developed their GPN framework ahead of Gereffi et al (2005)'s GVC model, aimed to improve several weaknesses of the GCC model. For instance, they propose a change in the nomenclature from chains to networks since in their view, the notion of a chain denotes "*production and distribution processes as being vertical and linear production process*" when in reality they are "*horizontal, diagonal, as well as vertical-forming multi-dimensional, multi-layered lattices of economic activity*" (Henderson et al., 2002, p. 442). They derive what they refer to as "*conceptual categories*" (p. 448) and "*conceptual dimensions*" (p. 453) in their framework. According to the authors, the conceptual categories form the pillars upon which the framework is built, and these are "*value"* (p. 448), "*power"* (p. 450) and "*embeddedness"* (p. 451). The conceptual dimensions are the agents or pathways through which the conceptual categories are carried out (Henderson et al., 2002). They indicate that this includes the "*firm"* (p. 453), "*sectors"* (p. 454), "*networks"* (p. 454) and *institutions"* (p. 455). Since Gereffi et al.'s (2005) GVC framework, which was established later, covers some of these issues, I will not delve deeply into this GPN model here.

Ernst and Kim's (2002) GPN framework is of relevance to this study because it focuses on an aspect of global production that is not sufficiently treated by the GCC and GVC frameworks – knowledge diffusion to developing countries. They indicate that their analysis is based on the ideas of the evolutionary theories (particularly Nelson and Winter's (1982) model). Their work is mainly a merger of Kim's (1998) learning framework, which I discussed earlier, and a production network framework.

They first describe the nature of production networks, indicating that they are promoted by "*institutional change through liberalization, information technology and competition*" (Ernst and Kim, 2002, p. 1419). They opine that foreign firms take advantage of market liberalisation in trade and capital markets to shift their production activities to developing countries even though this can trigger a race to the bottom by developing countries as they compete for foreign investments. Advancements in information technology, according to the authors, foster the coordination of activities over long distances which also boosts the development of GPNs. Finally, they argue that domestic and international competition also force firms to outsource some portions of their production process to improve their profitability. These actions, they indicate, are not only cost-saving measures but also opportunities to gain skills from their suppliers. This is one way that their model can be differentiated from the GVC framework since the transfer of knowledge is often considered as only benefitting the suppliers in the latter. In Ernst and Kim's (2002) own words:

> *"The main purpose of these networks is to provide the flagship with quick and low-cost access to resources, capabilities and knowledge that are complementary to its core competences. In other words, transaction cost savings matter. Yet, the real benefits result from the dissemination, exchange and outsourcing of knowledge and complementary capabilities"*
> (Ernst and Kim, 2002, p. 1420).

With regards to the players, they indicate that there are two types of "flagships" (analogous to lead firms in GVCs) – "*brand leaders*" (p. 1421) and "*contract manufacturers*" (p. 1421).[14] They also mention two types of suppliers – "*higher tier*" (p. 1422) and "*lower tier*" (p. 1422) suppliers. The higher tier suppliers will correspond to first-tier suppliers in the GVC chain

[14] In the GVC model, contract manufacturers are considered first or second-tier suppliers.

terminology; that is those in direct contact with flagships whilst the low tier suppliers only engage with the high tier ones (Ernst and Kim, 2002).

By relying on the learning framework developed in Kim (1998), they describe the process of knowledge transfer and diffusion as follows: the flagships (lead firms) can transfer explicit knowledge in the form of machine manuals and product specifications and the local suppliers change this knowledge into a tacit one through internalisation for their use in their operations. They add that the internalisation process may require assistance from the flagship who may ask the workers from the local supplier to come and receive training. Alternatively, the flagship may send its workers to the local supplier to assist them and the knowledge they bring, which is tacit, is added to the existing tacit knowledge of the local suppliers in a socialisation process (Ernst and Kim, 2002).

In addition, the authors argue that the explicit knowledge the local supplier receives in the form of manuals can be integrated into their own manuals and other codified materials in a combination process. Finally, the local supplier may codify the tacit knowledge it has gained in an externalization process (Ernst and Kim, 2002).

Although this framework enriches my understanding of knowledge transfer and diffusion mechanisms in global chains, the structure of the production network it uses lacks depth when compared to the GVC framework. In particular, the issues of governance of the chain are not adequately dealt here. Therefore, I do not use this network concept as my primary tool in investigating the tuna firms although I rely on the insights on knowledge transfer it offers.

**b. Knowledge transfer in the global chains.**

As I have stated above, Ernst and Kim (2002)'s GPN framework provides an elaborate conceptualisation on knowledge transfer, underpinned by the evolutionary models in global chains. However, because this tool will not be my primary framework for my empirical study, I now discuss knowledge transfer mechanisms in the other types of global chains.

Although it is widely accepted that developing countries can enhance their capabilities in GVCs, this process of knowledge transfer is not explicitly spelt out in GVC models. It is simply taken for granted. For instance, even though Baldwin (2011) opines that "*technological*

*lending*" (p. 6), which implies the transfer of technology from lead firms to their suppliers, occurs in the chain because it is in the interest of the lead firm to raise the capabilities of its suppliers to avert a compromise of their standards, he does not provide an in-depth analysis on this mechanism.

In Gereffi et al.'s (2005) governance framework, whilst supplier capabilities are influential in determining the governance structure of the chain, the model is fairly silent on the way these capabilities are developed except to suggest that interactions between lead firms and suppliers boost the skills of the latter and can induce a change in the governance structure of the chain.

The challenge associated with determining the mechanism of knowledge transfer in global chains is partly attributable to the confusion over what is being transferred; that is, whether the knowledge or technology being transferred is an end or a means to an end. According to Lall (1992), what developing countries receive are only the "*the results of innovation*" (p. 170) and therefore their skills are not enhanced to any significant degree. This is akin to the proverbial "*giving someone the fish instead of teaching them how to fish*". Therefore, he insists that developing countries must promote their own skills domestically instead of over-relying on foreign technology. If his postulation is right, then it can be argued that the GVC framework is insufficient in explaining how the capabilities of developing countries are enhanced.

On the other hand, if what is being transferred is the know-how to enable developing countries to achieve innovation, then the GVC framework can provide some insights into the enhancement of the capabilities of developing countries. In addition, it strengthens the argument that participating in GVCs can serve as a quicker and inexpensive path to promoting the technological capabilities of developing countries. Since this is the proposition that I investigate in this study, I adopt the position that in GVCs, lead firms transfer the knowledge to undertake innovation. By integrating the GVC framework with the innovation systems and technological capability literatures, I can examine in some depth, the process of knowledge transfer in GVCs.

### c. Upgrading in GVCs

As stated in Chapter 1, for this study, I consider upgrading processes and innovation as the same and they are the outcome of the acquisition of technological capabilities.[15] There are four common types of upgrading in the GVC model, namely *product*, *process*, *functional* and *inter sectoral* upgrading (Humphrey and Schmitz, 2002).

The most visible type is product upgrading where new products are created or improvements are made to existing ones which increases their value (Humphrey and Schmitz, 2002). Process upgrading affects the production process and may not be discernible simply by looking at the product even though its production is more efficient (Humphrey and Schmitz, 2002). Process upgrading can be significant, such as the case of a change in technology, or subtle, like a change in the organisational setup. Since product upgrading is inevitably induced by some form of process upgrading such as the use of new technology or packaging materials, I consider the two together as one component in my empirical work.

Functional upgrading implies that the firm, by virtue of gaining new capabilities, now occupies a higher position in the chain and performs new roles (Humphrey and Schmitz, 2002). In other words, its core competence has changed. Conventional GVC wisdom suggests that functional upgrading serves as a strong signal of an underlying processes of structural transformation. Finally, there is inter-sectoral upgrading (which is indicative of horizontal linkages) which involves using the knowledge and capabilities gained in one chain to participate in another chain or industry (Humphrey and Schmitz, 2002).

Barrientos et al. (2011) identify another type of upgrading which they called *social upgrading*. The authors argue that the current upgrading typology neglects the plight of vulnerable workers in the chain. In their estimation, all workers do not benefit equally when a firm undergoes upgrading and, in some cases, the conditions of certain categories of workers deteriorate in the process.

They present their argument in a model which categorises the workers and the nature of their work in the firm and shows how they are affected when the firm undergoes upgrading. Their model identifies five forms of work based on the level of intensity of skills required to

[15] Morrison et al. (2008) talk about the ambiguity over the relationship between innovation and upgrading in the literature where they are sometimes used synonymously and other times the former is viewed as causing the latter.

undertake them. The relative share of each category in the firm's activities depends on the type of firm in question (Barrientos et al., 2011).

For example, agriculture in developing countries is likely to be composed of small-scale, household-based and low-skilled labour intensive workers but will have a limited number of workers involved in highly skilled, technology intensive or knowledge intensive activities (Barrientos et al., 2011). However, in an IT firm that also produces hardware, small-scale, household based workers are few, whilst workers in high-skilled, technology intensive and knowledge intensive activities are many (Barrientos et al., 2011).

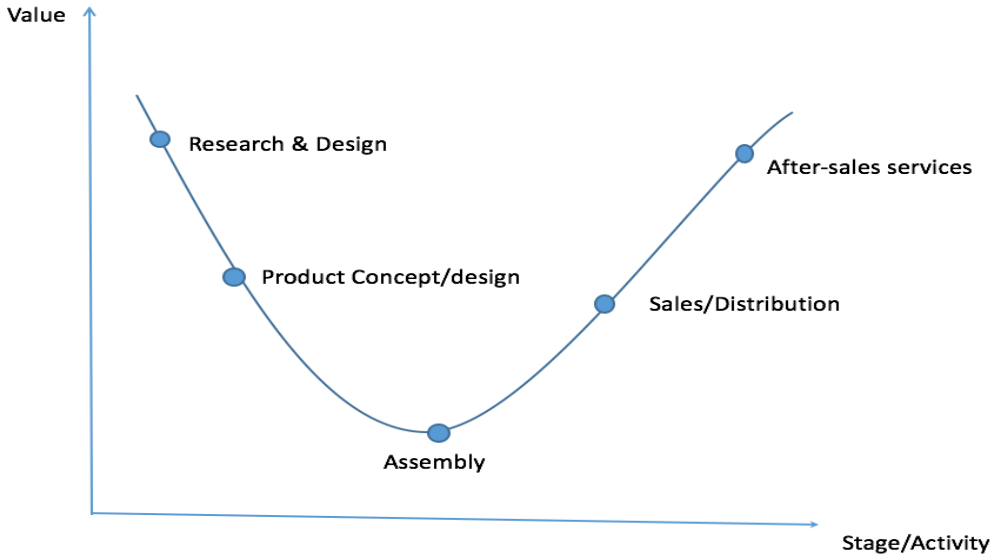
The authors classify workers engaging in low skilled and small-scale activities as "*irregular"* (p. 329) workers and these are usually women with high job insecurity whilst those occupying the highly skilled positions have greater job security and are "*regular"* (p. 329) workers. They indicate that in order to upgrade, the firms raise the remuneration of its regular workers to motivate them but tightens those of the irregular or casual workers to save costs (Barrientos et al., 2011). In addition, it is easier to train the skilled workers to enable them to adjust to the new functions or activities that are induced in the firm by upgrading while the low skilled workers may become redundant if their skills are no longer relevant to the needs of the firm after upgrading (Barrientos et al., 2011). Social upgrading therefore ensures that all workers benefit from upgrading and this can be done through strong labour laws to offer vulnerable workers greater protection (Barrientos et al., 2011).

### d. Income distribution in GVCs

I follow my discussion on social upgrading with an examination of the winners and losers when countries participate in GVCs. A useful analytical tool in this regard is the smile curve. This is shown in Figure 4 below where the various activities in the production process are matched to their value or the rents they generate. The most lucrative positions in the manufacturing chain, R&D, product design, sales and after-sales services, are undertaken by the lead firms whilst the less valuable activities are performed by suppliers in developing countries (Baldwin, 2012). Baldwin (2012) suggests that because manufacturing (including assembly) generates low rents in the chain, its position today as a driver of economic development is undermined. He states the following:

*"Now, exporting sophisticated manufactured goods is no longer the hallmark of having arrived. It may simply reflect a nation's position in a global supply chain"* (Baldwin, 2012, p. 19)

Figure 4 Smile Curve Showing Stages of Production




Source: Adaptation of Baldwin (2011, p. 18)

Kaplinsky (1998) suggests that participating in GVCs can induce immiserising growth – that is, deteriorating welfare of workers despite increased involvement in GVCs – in developing countries. According to him, this is due to the low entry barriers to the positions where rents are low which then fosters intense competition and subsequently, a race to the bottom as countries seek to increase their participation in GVCs. To avoid this, he stresses that firms must move into the activities that have both high value and increased entry barriers in the chain although this will be influenced by the firm's own strategies and capabilities. One can argue that within the standard GVC framework, immiserising growth is not anticipated because according to Gereffi et al., (2005), the framework is deemed to be dynamic and firms can improve their positions through upgrading.

## 2.5 Conclusion

In this chapter, I have critically reviewed the literature covering issues related to innovation, structural transformation and global value chains with the aim of establishing how innovation is achieved by firms engaged in GVCs. This is aimed at constructing an analytical framework for the conduct of my empirical study.

To this end, I have reviewed some studies on economic growth including innovation in both the mainstream and evolutionary traditions. I have also examined the literature on learning, technological capabilities, and GVCs and gone a step further to consider some studies that offer insight into institutional and macroeconomic conditions that support structural transformation. This is because the main motivation driving this study is an enquiry into the structural transformation of African countries (see Chapter 1).

Based on my review of the innovation systems literature and evolutionary studies, I have demonstrated how the mainstream growth models' inadequate treatment of the issues of learning and capability-building makes them insufficient to explain the process of innovation in firms and societies. This undermines the conventional wisdom that plugging into GVCs provokes a transfer of knowledge from lead firms which results in acquisition of capabilities and upgrading in the chain.

I have discussed how the evolutionary school offers a better analysis of the innovation process particularly as they stress the role of learning in the enhancement of firm capabilities. Together with institutional economics, which emphasises that institutions of the country are what determines its ability to innovate, they can be merged under the innovation systems framework (Nelson and Nelson, 2002). The innovation systems model departs from the suggestion that firms only gain knowledge from their own exploits like R&D, and states that multiple agents are involved in the knowledge-sharing process required for the enhancement of capabilities (Edquist, 1997).

The specific innovations system model I choose for my empirical study is the sectoral innovations systems. This model essentially accounts for the agents that are involved in the knowledge-sharing process within a particular sector or industry (Malerba, 2002). It is within this framework that the GVC literature can be integrated into the innovation systems model. Here, the GVC serves as just one source of knowledge or agent in the system. This is in sharp contrast to the mainstream assumption that the GVC can be the main or even sole source of

knowledge transfer. I also introduce works which examine a set of supporting institutions and macro policy environments that can facilitate a take-off and accelerate the process of structural transformation in Africa.

To complete the analytical framework, I also review different aspects of the GVC literature, including issues relating to upgrading, knowledge transfer and income distribution. These issues are explored further in the next chapter where I examine the empirical studies on the GVCs for various products. This enhances my analytical framework for my empirical study on the tuna GVC involving Ghanaian and Thai firms.

# Chapter Three
## Empirical Literature Review

### 3.0 Introduction

In the previous chapter, I set out an analytical framework where GVCs are integrated into sectoral innovation systems. In this chapter, I carry out an empirical literature review in respect of this analytical framework. My main focus is on GVCs, and I concentrate on three aspects – knowledge transfer, upgrading and linkages. Given that my empirical work on tuna encompasses the primary and processing sectors, the GVC studies I review here are mostly primary and manufacturing chains.

I examine the structure of different global chains, including their main players and their power relations. I also assess the factors that stimulate the successful entry of developing countries into global chains. By investigating the knowledge transfer activities in the chain, I can determine whether and to what extent foreign firms enhance the technological capabilities of their suppliers in developing countries. In addition, I evaluate other pathways that suppliers gain knowledge outside the GVC framework.

Under upgrading, I look at the common types that exist in various global chains. Of particular interest is functional upgrading, given its common association with structural transformation in mainstream analysis. I investigate the conditions that promote it as well as the different strategies firms adopt to circumvent the barriers they encounter in the process. I also examine the upgrading concept to verify its suitability to account for the various forms of innovation that a firm undertakes. Furthermore, I highlight how as an economic concept, it is devoid of social and political considerations (Rammohan and Sundaresan, 2003).

I consider connections between GVCs and the rest of the economy by examining three types of linkages: forward, backward and horizontal linkages (inter-sectoral upgrading).

The structure of this chapter is as follows: Section 3.1 explores how different GVCs are structured by examining the main actors or participants and the way they interact with each other. Next, I enquire into the factors that drive the participation of developing countries in GVCs. This is geared towards assessing the extent to which the low wage/cost advantage of

developing countries influence their participation in GVCs. I also investigate the various sources of knowledge to firms involved in GVCs to throw light on the common belief that the lead firms are primarily responsible for the development of the capabilities of their suppliers in GVCs.

Section 3.2 considers upgrading in value chains. The discussion is in three parts – a focus on functional upgrading in the chain, unconventional strategies towards achieving functional upgrading and an assessment of the weaknesses of the upgrading concept.

In Section 3.3, I analyse linkages that develop from the participation of suppliers in GVCs. These include forward and backward linkages as well as horizontal linkages which I also associate with inter-sectoral upgrading.

Section 3.4 presents my concluding remarks.

## 3.1 Structure of Global Value Chains

### a. Major players in global chains

Gibbon and Ponte (2005) analyse a set of agricultural and manufacturing chains involving African suppliers using primary data gathered by researchers under the "Globalization and Economic Restructuring in Africa" project (p. Preface xvii). The agricultural chains comprise of fresh vegetables, citrus, cocoa, coffee and cotton whilst the manufacturing chains include clothing (Gibbon and Ponte, 2005, p. Preface xi). The examination of multiple chains allows Gibbon and Ponte (2005) to compare them. They observe that the African producers usually do not interact directly with the lead firms but rather with intermediaries. In other words, their study suggests that most African suppliers enter global chains as second-tier suppliers since it is the intermediaries that act as the first-tier suppliers.

Furthermore, from Sturgeon and Kawakami (2011)'s review of multiple empirical studies on the electronics industry, it can be argued that even in complex manufacturing chains,

developing countries do not engage directly with lead firms but work with powerful contract manufacturers.[16]

Table 3 The Structure of Some Selected Agricultural and Manufacturing GVCs

| Value Chain | First-tier supplier | Lead firm |
|---|---|---|
| Coffee | International trader | Roasters/branders |
| Cocoa | International trading companies /grinding companies | Chocolate manufacturers and grinders |
| Fresh fruit & vegetable | Importing intermediaries/wholesale markets | Retailers |
| Clothing | Global trading houses/ global contract manufacturers | Retailers |
| Cotton | international trading companies, spinners | - |
| Electronics | Global contract manufacturers | Electronics Firms |

Source: Adaptation of Gibbon and Ponte (2005 p. 100) using notes from Gibbon and Ponte (2005, pp. 100-107)) and Sturgeon and Kawakami (2011) for electronics.[17]

According to Gibbon and Ponte (2005), the GVCs they examine in their study are generally buyer-driven with retailers dominating the chains as lead firms. The first-tier suppliers identified in Table 3 above do not merely organise the purchase of products from suppliers and make onward sales to lead firms but also manage the entire production chain including the activities of the lower-tier suppliers for their buyers (Gibbon and Ponte, 2005). In describing the functions of trading houses (first-tier suppliers) in the clothing chains in Europe for example, Palpacuer et al. (2005) suggest that they

> *"are former French, UK, or Scandinavian (in practice, Danish) manufacturers with overseas production capacity, who may also act as converters, importers, or overseas agents"* (Palpacuer et al., 2005 p. 417).

[16] In Sturgeon and Kawakami (2011), they identify two main tiers in the electronics value chain comprising of lead firms and contract manufacturers. However, they admit that some contract manufacturers deal with sub-contractors. Since these sub-contractors are likely to be in developing countries like China, I regard them as second-tier suppliers in this study.

[17] Gibbon and Ponte's (2005) Table 4.2 which is adapted in this chapter, is based on multiple sources. See p. 100 of their study for the full list.

In the electronics chain, the first-tier suppliers, who are mostly based in developed countries, such as the United States and Taiwan, may have some or all of their production facilities in developing countries like Mexico or China (Sturgeon and Kawakami, 2011). These first-tier suppliers, particularly those in the United States, emerged after purchasing the manufacturing arm of major companies such as Apple (Sturgeon and Kawakami, 2011). For the Taiwanese first-tier suppliers, they undertook contract manufacturing for their American buyers and overtime, they shifted production to developing countries like China (Sturgeon and Kawakami, 2011).

For the purpose of this chapter, I use the term – global suppliers – to represent all the different types of first-tier suppliers.

***Power relations in the chain***

According to Palpacuer et al. (2005), the huge costs associated with managing an entire supply chain, including monitoring the output of suppliers, has pushed lead firms to depend on global suppliers, who have a vast network of suppliers and a mechanism to check the standard of products, to act on their behalf.

Gibbon and Ponte (2005) indicate that in some cases, lead firms may become too dependent on a few powerful global suppliers, shifting the balance of power in the latter's favour. In other situations, such as happens in the cocoa chain, strong inter-dependence between lead firms and suppliers (that is chocolate makers and cocoa grinders) may neutralise the control one has over the other (Gibbon and Ponte, 2005). Lead firms, however, shield their power by boosting their pool of suppliers and in some cases, circumventing intermediaries to engage with producers directly (Gibbon and Ponte, 2005).

Palpacuer et al. (2005), who compare the power relations between lead firms in the UK, France and Sweden and their suppliers in the apparel industry, suggest that even though the UK firms usually operate with fewer suppliers, they maintain their control by committing their suppliers to tight contractual terms.

### b. Factors influencing the participation of developing countries in value chains.

As stated in Chapter 2, authors such as Lin (2011) have suggested that low wages can be an important driving force in spurring the shift of production by lead firms to developing countries. Therefore, I assess this common assertion by investigating the factors promoting the ascension of developing countries into GVCs.

Gibbon and Ponte (2005) and Staritz et al. (2017) suggest that the global trade regulatory framework has significantly influenced the structure of global chains. For instance, Staritz et al. (2017), who explore the clothing value chains in Madagascar, Mauritius, Kenya, Lesotho and Swaziland, argue that the African Growth and Opportunity Act (AGOA), a preferential trade agreement providing access to the US market to some sub-Saharan African countries, has stimulated investments from international firms mostly based in East Asia. Similarly, Bair and Gereffi (2001), who study the relationship between US clothing retailers and their suppliers in Mexico, indicate that the promulgation of the North American Free Trade Agreement (NAFTA) has resulted in Mexican suppliers replacing Asian producers in the chain.

Studies on primary commodity chains by Campling (2012), Dolan and Humphrey (2000) and Gibbon and Ponte (2005) show that some African economies are involved in global chains by virtue of their possession or production of raw materials. Campling (2012)'s thesis reveals how major tuna investors from Europe located processing facilities in Africa to be closer to their tuna fishing grounds. However, in the tobacco chain, cigarette factories are usually sited closer to end markets, making developing countries that enter the chain, operate merely as tobacco leaf growers or in some cases, leaf processors (Moyer-Lee., 2013).

According to Dolan and Humphrey (2000), lead firms are sensitive to issues relating to food standards and safety as well as concerns over labour and environmental conditions under which products are made. Since they carry the burden of ensuring that products consumed in the end markets are safe and meet all regulatory standards, they enact stringent conditions that potential suppliers must meet before engaging them in the chain (Dolan and Humphrey, 2000). This suggests that suppliers who do not have the capabilities to meet these conditions are excluded from global chains. In my empirical analysis later in this study, the issue of tuna products from developing countries meeting EU standards is discussed.

Kawakami's (2007) study suggests that countries that have a nascent or moderately developed domestic electronics industry are more likely to be chosen as locations by lead firms for outsourcing. His study highlights how Taiwan already possessed electronic firms and component suppliers prior to the arrival of the international notebook PC firms. In fact, the author suggests that the local firms had to demonstrate some minimum level of competencies before being chosen by their foreign buyers to manufacture the PCs.

Sometimes, certain locations are chosen by foreign firms because of prior qualities of local suppliers which allows them to produce high value products. Tokatli and Kızılgün (2009) point to fashion producers in Bursa, Turkey, who were chosen to produce high value fast-fashion products despite having higher production costs than their rivals in Asia. The authors indicate that the Turkish suppliers possessed strong capabilities in fashion due to the strength of their domestic textile industry (even before they entered the global chains) and this has placed them ahead of their competitors to meet complex changes in the global industry.

Sacchetto et al. (2013) demonstrate that in some instances, integration into GVCs by local suppliers is based on the exploitative intentions of the lead firm or global supplier. The authors cite the example of Foxconn, the global electronics contract manufacturer, which, facing strong opposition in Asia for low labour standards, established production facilities in Turkey where trade union power was weak. This demonstrates the potential cost of participation in GVCs on labour conditions; a phenomenon that is not sufficiently treated in the GVC framework. I consider some of these issues in Section 3.2.

**c. Promotion of the technological capabilities of developing countries.**

**i. Knowledge transfer within the chain**

I examine the situations where the lead firm or the global supplier is the source of knowledge to suppliers in the chain. Kawakami (2007)'s investigation into the factors accounting for the hegemony of Taiwanese sub-contractors in the global notebook PC manufacturing industry shows that the lead firms from the United States and Japan transferred knowledge to their Thai suppliers by training them directly on several production activities. In the author's own words:

> *"This process went hand-in-hand with the transfer of intensive technology and know-how from brand customers to Taiwanese ODM suppliers: they*

*worked with Taiwanese R&D engineers to solve a large number of technical issues; and they provided testing tools; and they trained Taiwanese testing engineers on how to analyze data. Moreover, they sent in teams of production engineers to carry various kinds of training"*
(Kawakami, 2007, p. 102)

Kawakami (2007)'s study also supports Gereffi et al (2005)'s proposition that the governance structure of GVCs can evolve. This is because even though the electronics suppliers were initially captive to their buyers, overtime the chains changed to relational or modular ones as the suppliers transformed from being original equipment manufacturers (OEMs) to original design manufacturers (ODMs) (Kawakami, 2007).[18]

Dolan and Humphrey (2000), who conduct a study on the UK supermarkets' control of the horticulture value chain involving African producers, indicate that the importers (first-tier suppliers) from Europe, "*provide technical assistance to exporters*" (p. 159) in Africa since the two (importers and exporters) are "*[responsible] for the day-to-day enforcement of [the] procedures*" (p. 159) set by the lead firms for their suppliers. Moyer-Lee (2013) argues that the first-tier suppliers, the "*independent leaf merchants*" (p. 144), also train the local tobacco producers on various production activities.[19]

Kadarusman (2010) merged the technological capability and the GVC models to examine how Indonesian electronics and garments firms experience upgrading and noted several instances where lead firms directly provided knowledge to its supplier. In one instance, the author narrates how the lead firm "*transferred knowledge on technical improvement of production management*" (p.153). The author argues that the governance structure in that specific GVC was a relational one and the lead firm sent its representative to the supplier's base.

**ii. Knowledge transfer outside the chain**

[18] Although Kawakami (2007) situated his study within the GVC framework, he did not explicitly apply the governance structures developed by Gereffi et al. (2005).
[19] The first-tier suppliers in this case will be the buyers for the suppliers in developing countries.

The analysis I undertake in this sub-section relates to the sectoral innovation system that local suppliers operate in. Some of the domestic agents in the economy that act as sources of knowledge to the suppliers are discussed.[20]

The first agent I consider is the local supplier or firm itself. That is, the strategies of the firm itself to gain knowledge outside the GVC framework. Kawakami (2007) notes that the Taiwanese firms invested in R&D which enhanced their capabilities and promoted their ascension into global chains. Lin et al. (2018) also show how foreign knowledge can still be gained by local suppliers outside the GVC framework. They indicate that Huawei Technologies located research centres near foreign universities which gave them access to foreign talents. In a similar way, Zhang and Gallagher (2016) argue that local Chinese suppliers in the Photovoltaic industry recruited foreign skilled workers into the firm. Another common strategy to gain knowledge is to acquire existing international firms and possess their capabilities and resources. Cheong et al. (2016) and Pananond (2013) report that Chinese and Thai tuna firms adopted this strategy to enhance their capabilities respectively.

Another source of knowledge to firms is their component supplier, both local and foreign. I quote Zhang and Gallagher (2016) extensively to illustrate this phenomenon:

> *"[M]ost of the PV production equipment was highly automated and equipment providers often provided equipment installation and technical training for the workers. The production process of using the equipment do not require complicated technologies and skills, which meant that barrier to entry was low if enough finance was available to buy the equipment"*
> (Zhang and Gallagher., 2016. p 195).

This reliance on foreign component suppliers is often termed as "*learning by importing*" (Haakonsson, 2009, p. 503). Haakonsson (2009) explores the factors behind the expansion of Ugandan pharmaceutical companies who are not involved in global chains. He finds that the local producers obtain knowledge from the technologies they get from their component suppliers. Similarly, Lebel et al. (2016), who examine the sources of knowledge for Thai and Mexican shrimp farmers, indicate that farmers collaborate closely with input suppliers to address many issues in production.

[20] Most of the studies I examine do not explicitly adopt the sectoral innovation systems framework for their analysis but simply indicate agents that transfer knowledge to the firm.

Technically, "learning by importing" also occurs within the GVC framework when the lead firm transfers machinery or equipment to its suppliers. However, the model implies that the lead firm controls the process. The empirical studies I just discussed suggest that the component or input suppliers engage directly with the local firms and collaborate to solve problems that emerge in production.

Other sources of knowledge include business associations comprising of firms in the same industry. Souza and Amato Neto (2010)'s study on the fruit GVCs involving Brazilian suppliers shows that the fruit suppliers formed a cooperative aimed at raising their capabilities to ensure their products met European standards. Similarly, Lebel et al (2016) describe how business associations supported the Thai shrimp farmer as follows:

> *"An important function of the associations has been the creation of a "seminar culture" run largely by and for the shrimp farmers and hatchery operators. At these meetings invited speakers, often successful farmers, talk about their experiences"* (Lebel et al., 2016, pp. 4587–4588)

Learning in a firm can also be directly induced by the state. In Chile, the government encouraged collaborations between Chilean and foreign scientists including those from the USA and Japan to improve their knowledge relative to salmon production (UNCTAD, 2006). Scientists were at the forefront of the growth of the industry as several of them started salmon companies (UNCTAD, 2006). Souza and Amato Neto (2010) describe how the state was instrumental in kickstarting fruit production in the São Francisco Valley including the establishment of a research centre to support the growth of the fruits (p. 528). Behuria (2020) also highlights the significant role of the Rwandan government in training local coffee producers in Rwanda to undertake production.

Intarakumnerd et al. (2015) explicitly apply the sectoral innovation system to Thailand's seafood industry. They identify four main knowledge agents in this system – "*firms, universities and public research institutes, government policy-makers and supporting institutions and private intermediary organisations*" (Intarakumnerd et al., 2015, p. 275). Their study is useful for my empirical work as it provides guidance in identifying the agents in Thailand's tuna industry (which is a part of its seafood industry). Their analysis focusses on

the domestic agents in Thailand and does not fully integrate it into the GVC framework. This is a significant weakness, which my study attempts to improve. [21]

## 3.2 Upgrading

### a. Upgrading processes within the chain

In this section, I set my focus on functional upgrading since there is greater controversy in the literature over its occurrence in GVCs. For product and process upgrading, Schmitz (2006) argues that there is unanimity in many studies regarding their occurrence especially in chains that the lead firm exerts strong control. My review of several empirical studies reveals that product and process upgrading is common in many GVCs. Giuliani et al.'s (2005) major study of 12 clusters in Latin America covering firms in "*traditional manufacturing, natural resource-based, complex products and speciali[s]ed suppliers*" (p. 554) indicates that, although product and process upgrading occurs across firms in all groups, it is only in the traditional manufacturing and natural resource-based groups that the lead firm significantly affects those upgrading processes.

According to Humphrey and Schmitz (2002), functional upgrading may not occur because the local suppliers are not interested in jeopardising current arrangements with their buyers by potentially rising to become their competitors. The authors make this observation in their study of the Sinos Valley cluster where they find local firms unwilling to take up functions like design for fear that their buyers will interpret such actions as challenges to their power.

Even if the local suppliers wanted to undertake functional upgrading, it is possible that the lead firm or global suppliers will frustrate or stall their efforts in order to protect their position in the chain (Schmitz, 2004). Staritz et al. (2017)'s study suggests that lead firms restrict the amount of knowledge they give to their suppliers and only provide that which is necessary for the supplier to perform its duty. They argue that international investors in the apparel industry only taught the African producers rudimentary functions such as "*cutting, trimming and making*" (CMT) apparel (p. 123). Another impediment to functional upgrading can be the

[21] For a more extensive review of empirical studies that show how innovation can be induced within and outside GVCs, see De Marchi et al (2018).

significant technical, logistical and financial resources that must be accumulated by the local suppliers towards undertaking higher and more complex functions in the chain (Schmitz, 2004, 2006).

Campling (2012)'s study also suggests that in some chains such as tuna, the strong power exerted by retailers has led to shrinking profits for brand owners. Based on his argument, one can argue that the rewards of functional upgrading by suppliers (rising to become a brand owner) may not be high enough to compensate for the costs associated with it.

It must be said that there is considerable evidence of lead firms promoting or at least not interfering in the functional upgrading of suppliers. Özatağan (2011) argues that rising costs in design pushed lead firms to delegate that function to their suppliers in Turkey's automotive industry whose capabilities had deepened by then. Similarly, Tokatli and Kızılgün (2009) suggest that for practical reasons, lead firms urged their Turkish producers to undertake design in order to meet the high demand for fast-fashion orders. Kawakami (2007) also recounts how the Taiwanese producers were assigned more functions in the chain, leading to their evolution from OEMs to ODMs.

According to Hobday and Rush (2007), the lead firm's corporate strategy is a determinant of whether or not it fosters upgrading in suppliers. The authors assess the Thai electronic industry and interview about fifteen suppliers of foreign firms. They find that Japanese and Taiwanese owners (lead firms) restrain their subsidiaries from undertaking complex activities in the chain but the European and American owners allow their subsidiaries to take on sophisticated functions (Hobday and Rush, 2007). The authors infer that the difference in the strategy of the owners is influenced by their proximity to their suppliers since the non-Asian owners prefer to devolve operations to their subsidiaries whilst the Asian owners can afford to perform some of the functions themselves because they are closer to the subsidiaries. However, in Kadarusman (2010) and Staritz et al (2017), regional lead firms are more supportive of functional upgrading than the global ones.

**b. Functional upgrading outside the GVC framework**

In this sub-section, I examine the strategies firms have adopted towards functional upgrading that are outside the conventional GVC framework. It has already been established in this chapter that suppliers in developing countries acquire global firms to raise their capabilities. Such measures allow them to also take over the position of the global firm they acquire.

Alternatively, firms struggling to break the power of lead firms can switch to local or regional markets where the lead firm does not operate in to sharpen their skills. This is Navas-Alemán's (2011) conclusion after observing the local firms in the Brazilian furniture and footwear industries, who concentrate on national markets, which allows them to stimulate their skills in more complex functions like "design" (p. 1394). Similarly, Kadarusman (2010) notes that Indonesian garment and electronics manufacturers experience functional upgrading when they supply to local and regional customers.

Another tactic some firms use is to move into a segment of the market that the lead firm does not operate in to avoid direct conflict. This approach was used by the Taiwanese electronic suppliers who started producing their own branded notebook PCs whilst serving their existing buyers (lead firms) (Kawakami, 2007).

### c. Weaknesses of the upgrading concepts

#### i. Narrow definition of upgrading

Gibbon (2001) extends the upgrading concept to account for processes, particularly in chains controlled by trading organisations, that cannot be accounted for by the types of upgrading in GVCs. He identifies two of them, with the first being; "*capturing higher margins for unprocessed commodities*" (p. 352), of which he writes:

> *"[T]he first of these forms is the capture of higher margins on exports of existing forms of unprocessed raw material, by moving up the quality grade ladder, increasing volumes and reliability of supply, securing remunerative contracts through forward sales and becoming active in hedging risk via utilizing futures and options instruments"* (Gibbon, 2001, p. 352)

The second process he indicates is "*producing new forms of existing commodities*" (p. 353) where the firm supplies new variants but not necessarily better quality of the crop. Similarly,

Ponte et al. (2014) attempt to expand the upgrading concept after examining activities in the aquaculture value chains in Bangladesh, China, Thailand and Vietnam. I quote them extensively below to make their case forcefully:

> *"[A]nalyses of product upgrading should include effects on product quality that do not necessarily lead to higher value added; conversely, there may be strategies related to the product itself (forward contracts, volume premia) that can have beneficial effects without changing anything in the nature of the product itself. Process upgrading need to include 'improved' practices that do not necessarily make processes more 'efficient', but that can allow developing country players to improve their position in value chains or even just maintain it in periods of restructuring. These include: matching strict logistics and lead times (time-to-market), delivering supplies reliably and homogeneously time after time ( a major challenge in agro-food products), being able to supply large volumes (improving economies of scale), being able to supply a variety of qualities (improving the economies of scope), and complying with environmental management, food safety and sustainability standards"* (Ponte et al., 2014, p. 4)

The authors develop their own upgrading typology – "*improve product, process, volume and/or variety and changing and/or adding functions*" (Ponte et al., 2014, p. 4). In addition, Ponte and Ewert (2009), who examine South Africa's wine industry, indicate that process upgrading must include the acquisition of certifications (p. 1644) or "*achieving higher margins with the same (or similar) products by accessing higher-margin markets*" (p. 1643)

### ii. Social and political aspects of upgrading

#### *Social aspects*

Rossi (2013) applies the social upgrading framework to a study of the garment industry in Morocco. The author argues that functional upgrading affects the social upgrading of workers because the performance of higher functions like design requires the raising of the skills and wages of the skilled workers whilst the unskilled workers are left behind due to their low capabilities.

Carr and Chen (2004) also find that joining global chains negatively affects women workers that undertake low paid vulnerable jobs. They opine that when the firm wants to lower its costs, it is the low paid work being undertaken by the women that experiences wage cuts or is made redundant in the absence of strong labour laws. Even though the authors' preoccupation in their study is not about upgrading, but rather the effect of GVC participation on workers, their findings contribute to the discourse on social upgrading. They use the term "*flexibli[s]ation of employment*" (p. 8) to denote the volatile nature of the jobs undertaken by women in most chains.

Knorringa and Pegler (2006) also conclude, after a review of the theoretical and empirical literature on how upgrading affects labour, that there can be an inverse relationship between upgrading in GVCs and the quality of the standard of living of low skilled workers. They argue that the firms must use strategies such as their "*corporate social responsibility (CSR)*" (p. 477) to raise worker conditions (Knorringa and Pegler, 2006).

Rammohan and Sundaresan's (2003) essay highlights the usefulness of considering the "*social implications of upgrading*" (p. 906). The authors, who investigate Southern India's coir yarn activities, argue that even where upgrading, according to standard definition, is not observed, by considering its social effect, it can be established that workers are better off.

***Political economy issues***

In Vicol et al.'s (2018) study of the Indonesian relationship coffee chain, which involves linking the coffee farmers directly to their buyers, they find that the benefits that are supposed to go to the farmers are rather expropriated by powerful local actors. The authors suggest that this undermines the objective of the project, which is to raise the living conditions of the farmers. In addition, because the farmers pursue multiple streams of income, of which coffee production is just one, they are unwilling to devote significant resources to the programme to boost their output (Vicol et al., 2018). This illustrates how local politics, in this case, the rise of special interests, can stifle upgrading. Also, it exemplifies how the non-alignment of the objectives of the parties in a project can hamper upgrading (Vicol et al., 2018).

Behuria (2020) suggests that a similar programme (relationship coffee) in Rwanda fared better due to the active involvement of the Rwandan government to connect the roasters to the

farmers. The author cites instances where the Rwandan president used his connections with top managers in major coffee chains such as Starbucks, to support the programme (Behuria, 2020). The active participation of the government prevented any special interest group or individual from usurping the programme like in Indonesia (Behuria, 2020). The Rwandan government sought to influence all levels of the chain, including supporting the farmers processing the coffee, marketing the product to foreign buyers and even stimulating the growth of coffee retail shops to improve Rwanda's position in the coffee chain (Behuria, 2020).

### 3.3 Linkages

#### a. Backward and forward linkages

The empirical literature is quite scant when it comes to the issue of linkages that form between domestic firms and those engaged in GVCs. There is evidence to show that contrary to Hirschman's (1958) suggestion, the establishment of linkages with the domestic economy is not automatic. In fact, integration into GVCs, instead of promoting backward and forward linkages to local firms, can actually reduce pre-existing linkages according to Rabellotti (2004), who conducts a study on the Italian industrial district of Brenta. The author argues that firms that hitherto were strongly connected to other local firms, experience "*functional downgrading"* (p. 23) when they join global chains since they have to abandon some functions like designing, which in turn severs their ties with local firms. Gibbon and Ponte (2005) refer to this downgrading phenomenon as "*marginali[s]ation*" (p. 138), which occurs when local firms plug into global chains and perform functions that are lower than what they previously did.

Gibbon and Ponte (2005) suggest that some local firms may experience "*exclusion*" (p. 138) where they are cut off from the GVC. This can happen for instance, when their relationships with other local firms end when those firms join GVCs and deal with international suppliers (Gibbon and Ponte, 2005). In some cases, the industry that is plugged into the global chain captures most of the resources like skilled workers and land which weakens the competitiveness of other local industries. This observation was made by Farole and Winkler (2014), whose study on technology spillovers from Foreign Direct Investments (FDIs) to domestic workers in some selected countries in sub-Saharan Africa, shows that in the short

term, some local firms struggle to keep their skilled workers, who can potentially earn higher at the foreign firms.

These arguments imply that Kadarusman (2010) and Navas-Alemán (2011)'s findings on the importance of local and regional markets may be helpful in promoting local backward and forward linkages compared to global chains.

### b. Inter-sectoral upgrading

Most GVC studies pay little attention to inter-sectoral upgrading. I postulate that like the case of functional upgrading, suppliers are likely to be inhibited from undergoing inter-sectoral upgrading by their buyers especially in chains where the lead firms exercise tight control. Even if it were possible, the financial and technical resources required makes it challenging to be pursued by many suppliers. In any case, each GVC has its own characteristics and merely acquiring skills in one chain does not imply a successful integration into another.

Despite this, inter-sectoral upgrading can be feasible for global suppliers since according to Gibbon and Ponte (2005), they accumulate resources and capabilities from working with different buyers and have developed a sophisticated supply network. In the case of local suppliers in developing countries however, they can potentially enhance their capabilities by focusing on local and regional chains in order to join new and diverse global chains.

## 3.4 Conclusion

In this chapter, I have reviewed the empirical literature on various aspects of the analytical framework developed in Chapter 2 with particular focus on GVCs. I have established that in several GVCs, firms from developing countries enter the chain as second-tier suppliers with the lead firms and global suppliers (first-tier suppliers) usually based in developed countries. This therefore potentially impacts the extent of the knowledge transfer from lead firms to the suppliers from developing countries.

I also show from the empirical literature that low wages are not necessarily the main drivers of integration of developing countries into GVCs. Instead, in some chains, it is the possession of

a raw material or the ability of the supplier to produce according to global food standards that determines whether they are part of GVCs.

In assessing how firms engaged in GVCs build up their capabilities, I find that there are multiple sources of knowledge they rely on including their lead firms and other agents that are external to the chain. In terms of upgrading, I have determined from the empirical literature that the attainment of functional upgrading in several GVCs appears to be elusive, leaving some suppliers to pursue unorthodox methods like acquisitions to rise in the chains.

I hint that the upgrading concept, as described in most GVC studies, is insufficient as it does not fully capture all activities that improve the firm's value in the chain. I have determined in this chapter that the concept also lacks a political and social dimension, which are critical for a comprehensive analysis on innovation. Finally, I have found that integration into GVCs potentially undermines existing linkages amongst local firms in the country.

In Chapter 4, I focus on the global tuna value chain.

# Chapter Four
## Structure of the Global Tuna Value Chain

### 4.0 Introduction

In Chapter 3, my empirical literature review of some selected GVC studies described the structure of those chains including their principal actors and how they interacted with one another. I also deliberated on some issues affecting the chains which have not been adequately incorporated into the formal GVC framework. In this chapter, I continue the analysis with a focus on the global tuna value chain by mapping the chain and examining the activities of the principal players at each node. This provides the reader with an overview of the structure of global tuna production before delving into the specific tuna chains in Thailand and Ghana in subsequent chapters.

I first examine the different tuna species since their unique characteristics influence the way the chain is shaped. I then assess the historical development of the tuna GVC to demonstrate how a set of national chains evolved into an integrated global chain. Following that, the current structure of the tuna GVC is evaluated which will indicate the specific roles of developing countries in the chain. [22]

By identifying the major players and their activities in the chain, I can analyse how they exercise power to maintain or improve their positions. Finally, I deliberate on some selected issues that influence the shape of the tuna GVC but which are often not factored in mainstream GVC analysis.

The rest of the chapter is structured as follows; Section 4.1 examines the structure of the global tuna chain. I first discuss the types of tuna species including the methods of harvesting them. I do this because their characteristics are consequential with regards to the structure of the chain. Next, I examine the evolution of the global tuna chain to see how production shifted from the developed countries to the Global South. I follow that with an examination of the principal players at each segment of the tuna GVC.

[22] The use of the term "developing countries" in reference to participants in the tuna GVC encompasses both developing and emerging economies.

In Section 4.2, I investigate the power relations in the chain where I look at the strategies the various players adopt to protect their rents. I follow this up with Section 4.3 where I consider some factors that shape the tuna chain. These include trade agreements and conservation measures. I present my conclusions on this chapter in Section 4.4.

## 4.1 Structure of the Global Tuna Chain

### a. Characteristics of the tuna species

The most important tuna species are the skipjack, albacore, yellowfin, bigeye and bluefin tunas (Corey, 1990; Hampton, 2010; International Seafood Sustainability Foundation, 2020). [23] The main tropical species, which are usually based in warm water, are the skipjack, the yellowfin and the bigeye, whereas the temperate species comprise of the albacore and the bluefin tuna (International Seafood Sustainability Foundation, 2020). Tuna, which is also a pelagic fish, tends to be significantly mobile, traversing large areas at a time (Corey, 1990).

The main tropical tuna species can reproduce all year round at very high rates (Hampton, 2010; International Seafood Sustainability Foundation, 2020). This bodes well for the sustainability of the tuna industry since it suggests that conservation measures induce the quick recovery of tuna stocks. There are however some differences amongst the species which implies that some face greater risks than others with regards to the maintenance of their stocks. For example, the yellowfin takes a longer time to mature and naturally die when compared to the skipjack (Hampton, 2010). The situation is even worse for the bigeye and albacore who take even longer than the yellowfin to develop into maturity (Hampton, 2010).

In terms of their sizes, there is great variation within or across multiple species (International Seafood Sustainability Foundation, 2020). The species at the two extremes are skipjack tuna, the smallest and bluefin tuna, the largest (International Seafood Sustainability Foundation, 2020). The albacore is the next smallest tuna after the skipjack whilst the yellowfin and bigeye are of similar size (International Seafood Sustainability Foundation, 2020). In the tuna industry, the large fish are more valuable as "*they yield more edible meat and require less labour to clean*" (King, 1987, p. 71).

[23] The bluefin tuna consists of the Atlantic bluefin, Pacific bluefin and Southern bluefin tuna (International Seafood Sustainability Foundation, 2020).

In terms of their uses, there are usually three: processing, sashimi or direct consumption (Lecomte et al., 2017).[24] In general, companies process skipjack, yellowfin, albacore and bigeye fish that are small in size and use the larger sizes (usually yellowfin, bigeye, and albacore) for sashimi, usually for the Japanese market (International Seafood Sustainability Foundation, 2020). The bluefin tuna is mainly used for sashimi (Lecomte et al., 2017).

The yellowfin and skipjack are popularly used for canning because after cooking they both produce a light meat, which implies that they are substitutable and can even be mixed during manufacturing, unlike the albacore that produces a white meat (Corey, 1990). However, the albacore enjoys strong patronage in the USA (Corey, 1990; King, 1987) "*because of its firm, white, 'chicken-like' flesh*" (King, 1987, p. 66).

Tuna is normally harvested using the pole-and-line (or baitboat (Campling, 2012)), the purse seiners or the longliners (Lecomte et al., 2017)[25]. As the name suggests, the pole-and-line or baitboat basically involves fishermen using a bait on a pole-and-line device to attract and then catch the tuna (Campling, 2012). This method results in "*one man, one fish, one hook at a time*" (Lecomte et al., 2017, p. 18) which makes this mode of fish production very attractive to conservationists (Lecomte et al., 2017). The baitboat is relatively mechanised and may have refrigeration systems that temporarily store the fish (Corey, 1990).

The purse seiner is a more efficient tool than the pole and line since it uses a net to catch greater quantities of fish at a time (Campling, 2012; Lecomte et al., 2017). According to Food and Agriculture Organization (2020a), a critical component of this mode of fishing is identifying groups of tuna for harvesting. The fishers sometimes use materials, called Fish Aggregating Devices (FADs), to induce the gathering of the fish, although that can lead to the luring and exploitation of juvenile fish (Food and Agriculture Organization, 2020a).

[24] The sashimi trade contributes about thirty-six percent (36%) of the value generated in the tuna market, making it a highly valuable segment of global tuna trade (Lecomte et al., 2017). This also suggests that based on the final use of the fish, the tuna GVC can be categorised into two types; the canned tuna chain and the sashimi chain (Lecomte et al., 2017). My study focuses on the former.

[25] Lecomte et al (2017) also mention the gillnet as an important tuna gear but that is excluded in this study since from the other studies I have reviewed, it is not identified as a major commercial tuna gear.

The longliner consists of a set of hooks with bait, with the highly mechanised ones designed for long stays at sea including up to two years (Food and Agriculture Organization, 2020b). They are primed for hunting big sizes of the different tuna species (Food and Agriculture Organization, 2020b).

### b. Historical development of the tuna GVC

Most accounts of the evolution of the tuna GVC, such as in Miyake et al (2010) and Campling (2012), concentrate on how the industry emerged in three main areas; Japan, USA and Europe, due to their initial dominance of the chain. Miyake et al. (2010) indicate that in France, tuna manufacturing received a boost in the 19th century as they emerged as a solution to sardine scarcity. This was also the case in the USA, where a sardine crisis left seafood manufacturers scrambling for alternative seafood to manufacture (Felando and Medina, 2012). At first, the American factories mainly manufactured the albacore specie but they faced shortages owing to their crude harvesting techniques and limited knowledge of the movement of the fish (Felando and Medina, 2012). The processing of albacore was therefore seasonal and mainly took place in California (Felando and Medina, 2012).

This dependence of manufacturing on regular supply of raw materials can explain why the growth of tuna manufacturing has been spear headed by the activities of tuna fisheries as suggested by Miyake et al. (2010), who noted how the European canneries established factories in West Africa, Seychelles, Mauritius and Kenya after their fishing fleet had started harvesting in the Atlantic and Indian Oceans.

Similarly, American canneries, who initially made significant investments in their local tuna fisheries, depended on fish supplies from the tuna fisheries (Corey, 1990). The American tuna fishers stayed in the Eastern Pacific until the El Nino incident and the insistence of the American manufacturers on "dolphin safe" practices, forced some fishers to either sell off their boats or move to the Western Pacific (Corey, 1990, p. 6 -2).[26] By this time, the reliance of the American manufacturers on the American fishers had been weakened by the prevalence of cheaper imports of tuna for manufacturing which prompted the canneries to cut back their investments into the tuna fisheries (Corey, 1990).

[26] According to Corey (1990), the extraction of dolphins as part of tuna harvesting mainly occurred in the Eastern Pacific, making the site the focus of the 'dolphin safe' (p. 6-2) policies.

The American canneries themselves started moving production from the USA to subsidiaries in developing countries such as Ghana, Puerto Rico and American Samoa (Corey, 1990). The acquisition of major canneries like Bumble Bee and Van Camp Seafoods by Thai and Indonesian companies also led to the production of some American brands in Asia. (Corey, 1990).

It is worth noting that developing countries gained some power or control in the global tuna trade after the enactment of the United Nations Convention on the Law of the Sea (UNCLOS), which granted them ownership over the fishery resources in their territorial waters (Campling, 2012) (for more on the UNCLOS, see United Nations, 1982). This forced foreign operators, who previously had unrestrained access to the waters, to now negotiate their use of foreign waters (Doulman, 1987).[27] According to Doulman (1987), whilst some Pacific island countries treated their tuna resource "*as a tradable commodity*" where "*they [were] prepared to sell harvesting rights to derive maximum financial returns*" (p. 40), others leveraged their ownership of their fishery resources to promote knowledge transfer and investments to raise the standards of the local fisheries. Indeed, according to Togolo (1987), some countries used external financial assistance to start their domestic tuna fishing operations.

### c. The organization of the tuna GVC today

I consider how the tuna GVC is organised today, noting the role developing countries play as the tuna fish moves from the sea unto the plate of consumers in Europe and America, by examining the main stages of the canned tuna chain - fishing, canning and retail.

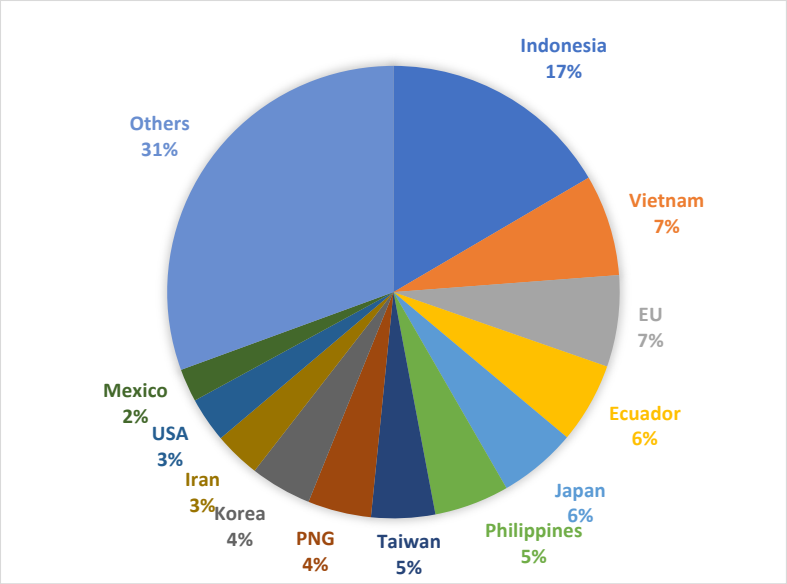
#### i. Tuna fishing

Figure 5 below highlights the strong presence of developing countries such as Indonesia, Vietnam, Ecuador and the Philippines in global tuna production. Furthermore, Figure 6 shows the dominance of the Pacific Ocean in global tuna production, with the Western Pacific accounting for about 54 percent of tuna catches in 2018. The Eastern Pacific contributes about

[27] Doulman (1987)'s study was primarily on the Pacific Islands but I find his arguments to be applicable to the other areas.

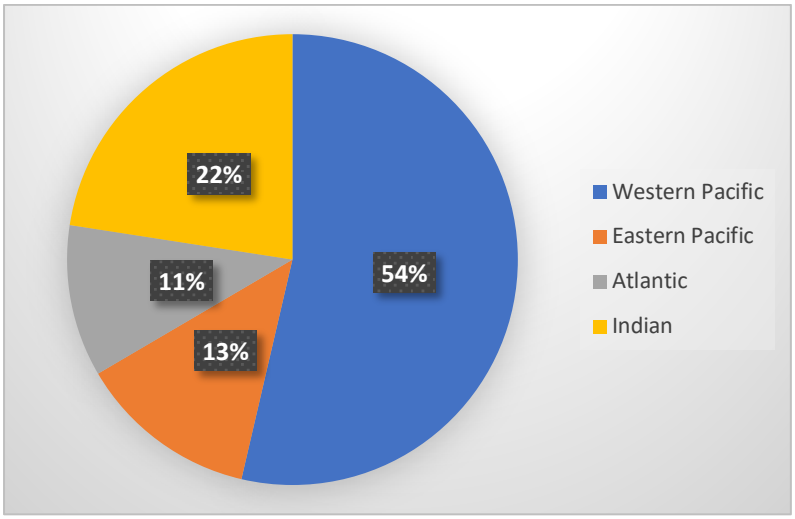
13 percent whilst the Indian and Atlantic Oceans account for 22 percent and 11 percent respectively.

Figure 5 Major Fishing Nations 2017 (metric ton)




Source: Author's illustration using data from FAO cited in Atuna (2020)

Figure 6 Share of Tuna Production by Oceans 2018




Source: Western and Central Pacific Fisheries Commission (2019)

For a developing country like Indonesia, it relies heavily on basic fishing gears, which affects the efficiency of its fishers (Sunoko and Huang, 2014). However, the size of its Exclusive Economic Zone (EEZ), which is more than 6 million km$^2$ (California Environmental

Associates, 2018), suggests that it has access to large vast of tuna resources.[28] The country largely restricts its fishing operations to its waters (Galland et al., 2016). They mainly produce for domestic processing and like the Philippines, the extra tuna that cannot be absorbed by domestic demand finds its way to Thai manufacturers (van Duijn et al., 2016).

The developed countries, who remain strong players in tuna production, now depend on fishery access agreements and in the case of the EU, whose fleet come from Spain, France, Italy and Portugal, the agreements enable them to mainly operate in the Atlantic and Indian Oceans (European Commission, 2020a). Some of the agreements entered in by the EU are presented in Table 4 below.

Table 4 Some Selected Tuna Fishery Agreements of the EU[29]

| Country | Duration | EU Countries | No. of vessels | Annual Fee (Euro) |
|---|---|---|---|---|
| Cape Verde | 2019-2024 | Spain, France, Portugal | 69 | 750,000 |
| Cote D'Ivoire | 2016-2024 | Spain, France, Portugal | 36 | 682000 |
| Seychelles | 2020-2026 | Spain, France, Italy, Portugal | 48 | 5,300,000 |
| Mauritius | 2017-2021 | Spain, France, Italy, Portugal | 85 | 575000 |
| Senegal | 2019-2024 | Spain, France | 45 | 1,700,000 |

Source: Adaptation of European Commission (2020a).

These fishery agreements allow the EU fleet to exploit tuna resources, although there are restrictions on the quantity of vessels to operate, in return for various fees which are partly used to develop the host country's fisheries (European Commission, 2020a).

For the United States, its fleet is mainly based in the Pacific region, having negotiated the US-South Pacific Treaty with about 16 island countries such as Samoa, Fiji and Kiribati, as well as Australia (IISD, 2016). The American catches usually end up in Thailand or Latin America (van Duijn et al., 2016).

Although so far I have identified the tuna fishing fleet by their flags, in reality, the owners of the vessels may come from overseas (van Duijn et al., 2016). In fact, in several cases, the mechanised tuna vessels, like purse seiners, are owned by "*large industrial groups or*

[28] Indonesia's water resources are estimated to be quadruple of the size of its land area (California Environmental Associates, 2018).
[29] The EU does not have a fishery agreement with Ghana.

*investment groups*" (Lecomte et al., 2017, p. 29). Since investments in mechanised tuna vessels require significant funds, the developing countries like Indonesia, that seek to have strong participation of indigenous fishers, allow the use of basic technologies, which comprised about 90% of all tuna harvesting gears in 2009 (Sunoko and Huang, 2014).

### ii. Tuna trading

The trading companies have emerged as important players in the tuna GVC, connecting a diverse group of fishers and processors, thereby eliminating the huge transaction costs associated with the purchase of tuna fish by the major canneries (Hamilton et al., 2011). The trading companies are able to aggregate large quantities of fish for the canneries whilst offering the fishers ready market as well as technical support (Hamilton et al., 2011). For instance. on the website of FCF, a tuna trading firm, it states that they "*provide turn key services such as: vessel building financing, crewing, provisions, bunkering, marketing, repairs and maintenance and compliance with the international marine regulations and regional marine resource conservation measures*" (FCF CO., LTD, 2020a).

Three tuna trading companies control this node of the chain – Tri-Marine, FCF fisheries and Itochu – managing about 30 percent of all the global catches (Lecomte et al., 2017). They also supply the Thai canneries with about 80 percent of their fish input (Lecomte et al., 2017). The trading companies have consolidated their position in the tuna GVC by entering into other segments such as the case of Tri-Marine, which owns its fishing vessels and canneries in the Solomon Islands (Hamilton et al., 2011). In 2019, the company divested its entire tuna operations to the international conglomerate, Bolton Group (Tri Marine, 2019). FCF fisheries operates canneries in Papua New Guinea and Ghana (FCF CO., LTD, 2020c) and has just acquired the number one tuna brand in the USA, Bumble Bee, for US $928 million (FCF CO., LTD, 2020b). Itochu, which belongs to a Japanese conglomerate, also has investments in canneries in Indonesia (Itochu, 2020).

### iii. Tuna processing and trade

There are two major types of tuna processors: those controlling their brands, also known as "*branded manufacturers*" (Campling, 2012, p. 122) and contract manufacturers, referred to as "*non-branded manufacturers*" (Campling, 2012, p. 122). The branded manufacturers include

traditional tuna companies associated with popular brands or retailers who are not tuna companies per se but have their tuna brands (Campling, 2012).[30] The traditional tuna companies may have been undertaking tuna processing previously but have now outsourced all or part of their production to the non-branded manufacturers whilst the retailers, who do not have any manufacturing capability or experience, rely on the non-branded manufacturers for their products (Campling, 2012). The discussion in this subsection broadly looks at tuna production and trade without specific reference to the categories of firms I have just outlined.

### *Global tuna processing*

Table 5 below shows the principal canned tuna producers in 2017. The data shows that some of the developing countries that have sizable tuna fishing operations (see Figure 5) are also important tuna processors which suggests that their domestic tuna fisheries mainly supply local canneries (van Duijn et al., 2016). An important exception is Thailand, the most powerful canned tuna producer, which relies on tuna fish imports from suppliers whose operations are based in the Pacific Ocean, such as Japan, the USA, Korea and Indonesia (Havice and Campling, 2018).

Table 5 Main Canned Tuna/Loins Producers 2017

| Country | No. of Canneries | Total Production (MT/day) | Share of Global Production |
|---|---|---|---|
| Thailand | 28 | 3540 | 25% |
| West Africa/Indian Ocean | 13 | 1860 | 14% |
| Ecuador | 20 | 1635 | 12% |
| Spain | 9 | 2030 | 9% |
| China | 11 | 680 | 5% |
| Mexico | 17 | 725 | 5% |
| Rest of Central/South America | 18 | 645 | 5% |
| Philippines | 7 | 510 | 4% |
| Western & Central Pacific Ocean | 7 | 595 | 4% |
| USA | 4 | 1285 | 3% |
| Indonesia | 13 | 365 | 3% |
| Vietnam | 12 | 420 | 3% |

[30] I use the term, retailers, to represent all the firms that own tuna brands but are not tuna companies. Campling (2012) calls this category of firms '*marketing companies'* (p. 123).

| | | | |
|---|---|---|---|
| Korea | 5 | 440 | *3%* |
| Italy | 10 | 520 | 1% |
| France | 4 | 136 | 1% |
| Portugal | 4 | 135 | 1% |
| North Africa | 13 | 144 | 1% |
| Japan | 12 | 184 | 1% |

Source: Adaptation of Havice and Campling (2018, p. 15)

The canneries either process tuna fish from the fishers or tuna loins from other canneries (Campling, 2012; Lecomte et al., 2017). The tuna loin is derived from tuna fish that has been prepared after passing through the initial stages of processing (Campling, 2012). Since the preparation of the fish is labour intensive, importing the loins instead of the whole fish is an important cost-cutting strategy of firms (Campling, 2012; Lecomte et al., 2017). The major European manufacturers, Spain, France and Italy, are highly dependent on tuna loins (Laxe and Gamallo, 2008) with Spain, the dominant tuna manufacturer, procuring its tuna loins mainly from Ecuador, China and Papua New Guinea (European Market Observatory for Fisheries and Aquaculture Products, 2017). Spain, which produces about 70 percent of Europe's canned tuna (Seafood Trade Intelligence Portal, 2021), mainly supplies its domestic and European consumers (European Market Observatory for Fisheries and Aquaculture Products, 2017). The country however still imports canned tuna from Ecuador (almost 60 percent), Mauritius and Salvador (European Market Observatory for Fisheries and Aquaculture Products, 2017).

French producers use the loins for tuna salads, depending instead on their suppliers in developing countries like Cote D'Ivoire and Senegal in the Atlantic Ocean and Seychelles in the Indian ocean, for their canned tuna supply (Laxe and Gamallo, 2008). Italy's domestic tuna market is served by canned tuna imports from Spain and Ecuador (Seafood Trade Intelligence Portal, 2021).

The United States market is supplied by domestic production, that utilises loin imports, and foreign supplies of canned tuna from Thailand and Ecuador (Havice and Campling, 2018). Domestic tuna manufacturing in Japan is very small with only one cannery in operation as the industry is dominated by the sashimi market (Lecomte et al., 2017).

***International trade in processed tuna***

Tables 6 and 7 present an overview of the international trade in processed tuna.[31] From Table 6, the developing countries that dominate processed tuna exports are also the main producers indicated in Table 5, which implies that these countries mainly produce for export. Spain shows up in Table 6 as a major tuna exporter since it supplies other European countries like France, Italy and Portugal (Seafood Trade Intelligence Portal, 2021).

Table 6 Main Exporters of Processed Tuna Products

| | Quantity (100 m/t) | | | Value ($ million) | | |
|---|---|---|---|---|---|---|
| | **2017** | **2018** | **2019** | **2017** | **2018** | **2019** |
| Thailand | 4902.72 | 5143.93 | 4665.90 | 2082.79 | 2274.45 | 2185.18 |
| Ecuador | 2185.68 | 2222.99 | - | 1055.48 | 1109.98 | - |
| Spain | 956.96 | 1006.59 | 944.59 | 584.12 | 645.46 | 578.83 |
| Indonesia | 768.03 | 822.34 | 781.56 | 358.72 | 387.29 | 411.05 |
| Philippines | 2616.64 | 1349.90 | 871.85 | 370.24 | 353.02 | 356.17 |
| Netherlands | 516.15 | 511.07 | 487.73 | 260.06 | 280.70 | 266.26 |
| Viet Nam | 457.84 | 436.73 | 481.67 | 251.82 | 249.35 | 253.33 |
| Mauritius | 555.55 | 606.14 | 579.02 | 277.62 | 271.84 | 241.75 |
| Seychelles | 347.01 | 354.80 | 350.40 | 255.87 | 274.94 | 226.87 |
| Italy | 234.94 | 247.53 | 255.13 | 180.68 | 207.06 | 196.40 |
| Ghana | 282.63 | 286.62 | 297.31 | 140.68 | 154.32 | 145.27 |

Source: United Nations (2020). Data on Ghana provided by TA2

In addition, the Netherlands, listed as an important tuna exporter in Table 6, despite not being recognised as a major manufacturer, only serves as a transit corridor for imports into Europe (Seafood Trade Intelligence Portal, 2021). The data on the main importers of processed tuna shown in Table 7 suggests that tuna consumption is primarily undertaken by the developed markets with the European countries collectively dominating the market together with the USA and Japan.

Table 7 Main Importers of Processed Tuna Products

[31] I use the term “processed tuna” instead of canned tuna to encompass the various types of manufactured tuna products. .

| | Quantity (100 m/t) | | | Value ($ million) | | |
|---|---|---|---|---|---|---|
| | 2017 | 2018 | 2019 | 2017 | 2018 | 2019 |
| USA | 1973.32 | 2087.37 | 2129.34 | 976.08 | 1102.56 | 1129.68 |
| Italy | 1178.50 | 1289.30 | 1185.30 | 746.84 | 869.01 | 737.33 |
| Spain | - | 1282.78 | 1546.57 | 623.95 | 705.60 | 712.62 |
| France | 996.92 | 1052.93 | 959.06 | 517.21 | 571.87 | 518.12 |
| United Kingdom | 1078.24 | 1048.99 | 1036.61 | 512.20 | 552.55 | 512.94 |
| Japan | 629.62 | 652.03 | 650.91 | 346.25 | 377.41 | 366.36 |
| Germany | 844.44 | 932.01 | 790.86 | 380.51 | 466.52 | 356.63 |
| Netherlands | 529.06 | 480.38 | 653.24 | 250.31 | 237.72 | 307.10 |
| Australia | 456.22 | 471.19 | 441.31 | 226.81 | 241.90 | 222.05 |
| Saudi Arabia | 339.73 | 429.81 | - | 147.93 | 194.10 | - |
| Canada | - | - | - | 148.38 | 167.96 | 162.37 |
| Egypt | 300.68 | 552.35 | 540.39 | 82.76 | 180.75 | 162.12 |

Source: United Nations (2020)

Although canned tuna is traded extensively, each major consumption market is usually dominated by a few unique tuna brands as can be seen in the USA, where only three brands have more than 80 percent of the market share both by value and volume (Melbourne (2016), as cited in Lecomte et al., 2017. p. 42). The distribution of the market share amongst the three brands are as follows: Star Kist, 40 percent; Bumble Bee, 26 percent and Chicken of the Sea, 15 percent (Melbourne (2016) as cited in Lecomte et al., 2017. p. 42).

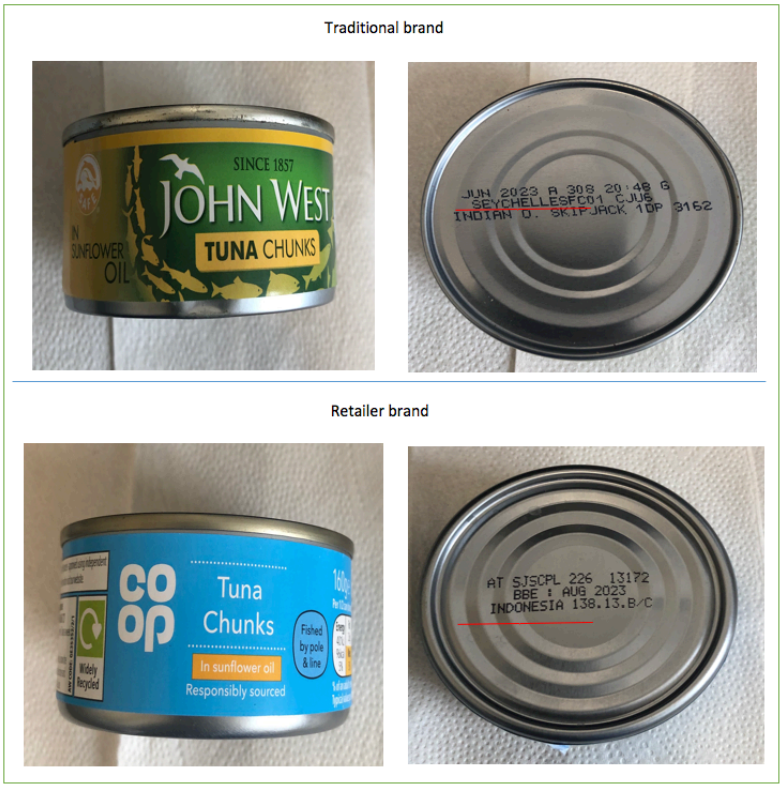
In France, the principal tuna brands are Saupiquet and the market leader, Petit Navire, which generates over 35 percent of the value in the market (Seafood Trade Intelligence Portal, 2021). The UK is dominated by brands such as John West and Princes but also experiences the consumption of private labels (Seafood Trade Intelligence Portal, 2021).

German consumers generally prefer private labels whilst in the Netherlands, they mostly buy the top UK brands like John West and Princes as well as the Italian Rio Mare, due to the lack of local tuna brands (Seafood Trade Intelligence Portal, 2021).

Although the powerful tuna brands just mentioned are associated with markets in Europe and the US, most of them are now assets of Asian companies who purchased them from their previous American and European owners. As at 2008, there were five multinational corporations controlling the tuna market – Thai Union, Bumble Bee, Star Kist, Bolton and Heinz (Laxe and Gamallo, 2008). Heinz, owners of the American Star Kist, had earlier

purchased some of the major European brands, which it later sold to MW Brands (Campling, 2012), whilst Bumble Bee has passed from American ownership to Thai (Corey, 1990), and then back to investors based in the Global North including the private-equity company, Lion Capital (Fusaro, 2020) and now belongs to the Taiwanese trading company, FCF Fisheries (FCF CO., LTD, 2020b). Thai Union took control of America's Chicken of the Sea brand in the late 1990s and later bought MW Brands, thereby having control over the major European brands (Campling, 2012; Pananond, 2013; Thai Union, 2020). The South Korean conglomerate, Dongwon, now owns the Star Kist brand (Havice and Campling, 2018).

Figure 7 Canned Tuna Products of a Tuna Company and Retailer



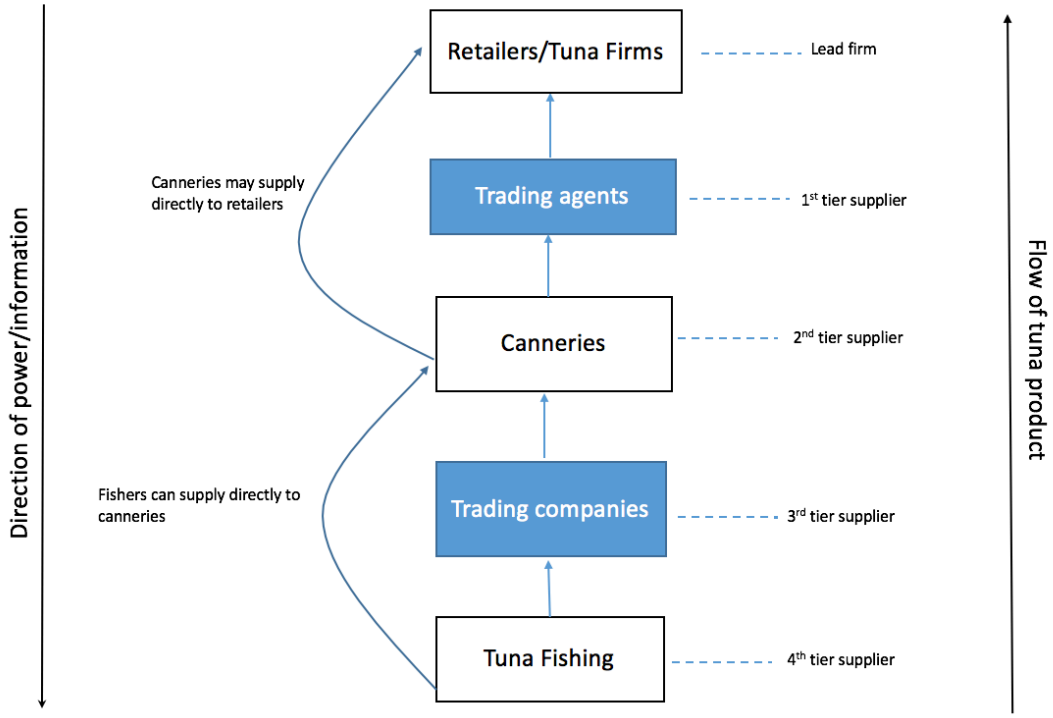

Source: Author

Figure 7 above shows two canned tuna products in the UK market, one belonging to a traditional brand, John West, and the other, to a retail outlet, Co-op. The top of the cans provides more information on where they were produced (red lines mine). The top of the John West can (2nd image under traditional brand) indicates that the product was canned in Seychelles with tuna fish (skipjack) extracted from the Indian Ocean. The Co-op canned tuna was produced in Indonesia according to the information on the top of the can (2nd image under retailer brand).

## 4.2 Power Dynamics in the Tuna Chain

In examining the power relations among the actors in the tuna GVC, I consider the governance structures guiding their engagements as well as the strategies they adopt to maintain or improve their positions in the chain. In Figure 8 below, I present a schematic overview of the tuna GVC including its various segments. I consider the tuna fishing activities to be at the base of the chain as they are usually the starting point of the production process.

Figure 8 Outline of the Tuna GVC




Source: Author

In Figure 8, the tuna fishers are the fourth-tier suppliers. Since the fishers are integrated into the chain in different ways, the governance structures that guide their interactions with their buyers vary. For instance, those that are subsidiaries of canneries are likely to be under a hierarchical governance structure based on the GVC framework (see Chapter 2). For the tuna fishers that are not owned by the canneries, since they usually supply directly to the canneries or trading companies (Lecomte et al., 2017), the governance structure in those chains will depend on the degree of freedom they have, as that determines if they are in either a market or modular relationship with their buyers. However, because only a small number of trading

companies deal with the fishers (Hamilton et al., 2011; Lecomte et al. 2017), the fishers can also be described as being in a captive relationship with their buyers. Since Hamilton et al. (2011) suggest that the trading companies tend to deal with the fishing vessels based on "*trust and historical dealings*" (p. 137), it can be argued that entry barriers for new vessels that want to sell to the trading companies are high. In any case, because some of these trading companies are vertically integrated into fishing activities, like the case of Tri-marine producing 20 percent of its own fish (Hamilton et al., 2011), it deepens the vulnerability of the fishers.

It is also possible for the balance of power to tilt towards the fishers, particularly in their relationship with the canneries. This scenario can be envisaged in a situation where the canneries do not have a diverse pool of suppliers. Trade agreements can potentially create the conditions for this situation, which according to Campling (2016), is the case for countries without sufficient domestic fishing capabilities, who have to rely on the EU fishers for their raw material supply in order to benefit from trade rules by the EU.

With regards to the relationship between the trading companies and the tuna canneries, their mutual reliance on each other may lead to some form of relational governance structure even though each has adopted some strategies to reduce their dependence on the other. For instance, the trading companies now own some processing facilities whilst some of the canneries make direct arrangements with large fishing firms to reduce their dependence on the trading companies (Hamilton et al., 2011). Some big tuna companies such as Bolton Foods have formed strong ties with trading companies like Tri Marine by buying stakes in them (Havice and Campling, 2018), potentially mitigating against predatory behaviour from one side against the other.[32]

The canneries in developing countries are mostly contract manufacturers who are either independent from their buyers or are subsidiaries.[33] Where they are subsidiaries, they are likely to be in a hierarchical relationship with their lead firms, who can exercise total control over them. For example, based on Thai Union (2020), it appears Thai Union, has complete power over its subsidiaries in Ghana and the Seychelles producing its European brands. In these chains, the canneries in developing countries are first tier suppliers.

[32] Bolton now fully controls Tri-Marine's tuna arm (Tri Marine, 2019)
[33] Even though some suppliers are now owners of the premium tuna brands, they still produce private label like the case of Thai Union (Thai Union, 2020)

Where the suppliers are independent from their buyers, and experience greater freedom in their decision making, then it suggests that they are in a modular governance structure with their buyers. In reality, irrespective of the degree of freedom they have, the enormous power of the retailers makes the suppliers captive to them. Some of the ways the retailers wield their power over suppliers include their shifting of risk to their suppliers. In describing this situation, Lecomte et al (2017) state that when the supplier faces unanticipated price hikes in inputs, it is unable to pass it on to its buyers since prices have been predetermined. Campling (2012) also demonstrates the vulnerabilities of the suppliers by highlighting how the competition amongst retailers, leading to price cuts, can force their suppliers to scale down their processing activities from full tuna manufacturing to loin production, in order to stay in business.[34]

***Supermarket power***

The retailers do not only exert control over their contract manufacturers but also the tuna companies that possess the premium tuna brands. The problem for the tuna companies is that the retailers prefer to keep the prices of tuna products low to maintain its patronage even though available evidence suggests that the demand for tuna is relatively price inelastic (Guillotreau et al., 2017).

Some of the strategies the supermarkets use to depress canned tuna prices include using their own brands to undercut the premium brands of the tuna companies (Campling, 2012; Guillotreau et al., 2017). The tuna companies also face further pressure from the practice of "*slotting*" (Havice and Campling, 2018. p. 60). According to Havice and Campling (2018), this practice can be explained as:

> *"[A] branded-firm pays a fee for premium shelf space for a period, and even then may be squeezed for additional revenue within that period to maintain their retail 'real estate'* (Havice and Campling, 2018, p. 60)

## 4.3 External Factors Affecting the Tuna Chain

[34] Campling (2012) calls this scaling down in activities as an example of "*downgrading*" (p. 179).

### a. Trade agreements

Trade agreements potentially give some suppliers an advantage over their competitors when they experience lower tariffs on their exports to the partner's market (Guillotreau et al., 2017). An instance of this in the tuna industry is how the Economic Partnership Agreement (EPA) allows the exports of canned tuna products into the EU at zero tariffs as long as the tuna fish is caught by a vessel registered by a member country of the agreement (Campling, 2016). In comparison, some countries without free trade agreements with the EU such as Thailand, Indonesia and Vietnam pay 21.5 percent in tariffs (Campling, 2016).

The preferential trade agreements can be the driving force of the tuna industries of some developing countries as noted by Campling (2012), where he argues that developing countries like Ghana rely on the EPA to compete with their Asian counterparts. As will be elaborated in my empirical analysis, trade agreements potentially lock countries into specific tuna markets like Ghana's current dependence on the EU. This captive situation conveys significant power to the end markets who can control all agents in the chain.

The advantages afforded to countries that enter into trade agreements have spurred a drive by many developing countries to negotiate trade agreements with their end markets. For example, Ecuador already has a free trade agreement with the EU whilst the Philippines is currently discussing one (European Commission, 2020b).

### b. Conservation measures

As tuna is a renewable resource, there have been concerns over conservation schemes to maintain the sustainability of the product. With regards to the current framework for the conservation of the tuna fish, the different countries involved in its production are organised into the Regional Fisheries Management Organisations (RFMO), which are associated with particular oceans (Løbach et al., 2020). The RFMOs monitor the stocks of the various species and institute measures aimed at protecting the vulnerable ones (Løbach et al., 2020). Therefore, depending on where a country's operations fall, the restrictions could affect its participation and competitiveness in the chain which can result in its buyers shifting to new suppliers.

Apart from the regulations that the RFMOs or national governments institute to protect fish species or regulate labour practices, private organisations such as NGOs have also developed Eco labels, which some companies seek to qualify for, to demonstrate that their product was produced using appropriate practices (Oosterveer, 2010). These certification schemes include the Marine Stewardship Council's (MSC) label which endorses a country's fishery practices as being ecologically safe (Macfadyen and Huntington, 2007). The environmental concerns that are raised by these organisations can affect the public image of companies and lead to legislation as happened during the dolphin crisis in the USA where canneries had to demonstrate that the harvesting of tunas did not jeopardise the sustainability of dolphins (Corey, 1990). In that instance, meeting the requirements came at extra costs to the tuna companies (Corey, 1990).

### 4.4 Conclusion

This chapter has thrown light on the global tuna value chain by tracing its evolution from a group of separate national chains to its current structure. It has also been established from studies including Miyake et al (2010), that the global search for tuna fish as well as the pursuit of low-cost advantages by developed countries fueled the participation of developing countries in the tuna GVC. Developing countries are now major players in the fishing and processing segments of the chain although the consumption of processed tuna mainly occurs in the developed markets.

Interestingly, most of the major premium tuna brands consumed in the principal tuna markets now have Asian owners after a string of acquisitions in the industry saw the displacement of European and American investors from the chain. The power that the retailers/supermarkets exert over all other participants in the tuna GVC has been examined in this chapter. The analysis of power relations in this chapter has shown that irrespective of the type of governance structure they operate in, suppliers from developing countries come under strong control of their buyers.

Finally, the influence of trade agreements and conservation schemes in shaping the tuna GVC has been discussed where it has been demonstrated that these measures can raise the barriers for participating in GVCs for certain countries.

# Chapter Five
## Methodology

### 5.0 Introduction

In this chapter, I present the methodology adopted for my empirical study and I demonstrate its suitability for answering my research questions. I do so by first discussing why a qualitative research approach is appropriate for this study based on the nature of my research questions and the type of data I expect to collect.

I also justify why I utilise a case study method by examining the common criticisms made against it. I discuss some strategies that can be adopted towards ensuring that the case study meets the reliability and validity tests for research. This leads to a discussion of my data collection and analysis activities in Ghana and Thailand where I establish how they align with the reliability and validity conditions.

The rest of the chapter is structured as follows; Section 5.1 provides a basis for my choice of a qualitative research approach for this study. I briefly discuss the case study method including its common misconceptions. I also deliberate on the issues of reliability and validity with regards to case study research based on the framework established by the COSMOS Corporation which is outlined in Yin (2003) which guides researchers to ensure their work is robust. The analysis serves as a background for my subsequent discussions in later sections.

In Section 5.2, I provide a brief report on the data collection exercise for this study. This includes an account of my fieldwork in Ghana where I discuss the participants in my research, the procedures I use to gather my data and the challenges that emerge and how they are solved. I also talk about how the data on Thailand is collection. The information provided in this section helps the reader to determine the strength of my work using the reliability and validity tests determined in Section 5.1.

In Section 5.3, I discuss the methods I utilise in my data analysis and mention some major shortcomings of my empirical work. I make my conclusions in Section 5.4.

## 5.1 Type of Research

### a. Choice of Qualitative research

Qualitative research adopts "*an interpretative paradigm, which emphasi[s]es subjective experiences and the meanings they have for an individual*" (Starman, 2013, p. 30). Mack et al (2005) suggest that qualitative research "*[provides] complex textual descriptions of how people experience a given research issue*" (p. 1) and can "[*identify] intangible factors…whose role in the research issue may not be readily apparent*" (p. 1 - 2). These two studies I have just cited underscore the centrality of personal experiences to qualitative research.

Furthermore, Mack et al (2005) identify some major differences between quantitative and qualitative research (see p. 3 of their study) which are influential in my choice of a research approach. I discuss two of these here. The first is the "*analytical objectives*" (see table 1 (p. 3) of their study) of both methods where according to the authors, the quantitative research is preoccupied with "*[predicting] causal relationships*" (p. 3) whilst qualitative research aims "*to describe and explain relationships*" (p. 3). My research requires a qualitative approach because it is geared towards explaining the innovation process in GVCs including how learning and capability-building takes place rather than just merely identifying factors that cause innovation. Second, Mack et al (2005) talk of the issue of "*flexibility*" (p. 3) where they suggest that the nature and form of a quantitative research stays the same for the entire period of the research unlike the case of a qualitative research where the study can be modified in response to new information or changing conditions. Since I anticipate that my fieldwork research on tuna GVCs includes some under-researched areas, coupled with the fact that my fieldwork objectives require a flexible approach so as to incorporate new information into the research design, a qualitative method is best suited for this study.

In any case, my review of some existing studies and datasets as well as my discussions with researchers working on Ghana, have laid bare the challenges with adopting a quantitative approach for my study. Available datasets on Ghanaian manufacturing firms such as the World Bank's Enterprise Survey, do not contain specific information needed for my analysis.

**b. Case study**

Yin (2003) argues that case studies are relevant when the context within which the problem occurs is germane to the research. The author underscores this point by stating that:

> *"[A] case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident"* (Yin, 2003, p. 13).

Hancock and Algozzine (2006) expatiate this argument by indicating that

> *"case study research is richly descriptive, because it is grounded in deep and varied sources of information. It employs quotes of key participants, anecdotes, prose composed from interviews, and other literary techniques to create mental images that bring to life the complexity of the many variables inherent in the phenomenon being studied"* (Hancock and Algozzine, 2006, p. 16)

However, the case study approach is often derided by its opponents who question its adequacy as a research method (Flyvbjerg, 2006). Flyvbjerg (2006) identifies five main criticisms (see p. 221 of his study) which are: 1) individual case studies are inadequate for generalisations which undermines their impact on science; 2) they are rooted in particular contexts making them inferior to those with universal application; 3) beyond helping to form a hypothesis, their usefulness is severely limited as they cannot even be used to test the hypothesis; 4) findings cannot be trusted as they are often compromised by the researcher's beliefs and 5) individual case studies do not engender the formulation of theories.

In refuting these objections, Flyvbjerg (2006) notes that whereas common knowledge on an issue is useful, expertise on that issue can be built up by examining several case studies owing to the context-specific knowledge they provide. He also argues that social science's attempt to enter the sphere of producing forecasting models is a fruitless venture and efforts must be focused on expanding knowledge on various issues within their specific contexts.

He asserts that the inordinate focus on "*formal generalisation*" (p. 226) as the measure of scientific rigour is based on an erroneous assumption that it is the only way of improving

scientific research. However, by considering formal generalisation as just one tool in a toolbox of scientific approaches, the argument that individual case study research is not suitable for hypothesis-testing, thereby making it an inferior method of enquiry, will not hold (Flyvbjerg, 2006).

In explaining how case studies affect generalisations, the author states;

> *"The case study is ideal for generali[s]ing using the type of test that Karl Popper (1959) called "falsification", which in social science forms part of critical reflexivity. Falsification is one of the most rigorous tests to which a scientific proposition can be subjected: If just one observation does not fit with the proposition, it is considered not valid generally and must therefore be either revised or rejected"* (Flyvbjerg, 2006, pp. 227–228*)*

This further underscores the author's argument that the challenges of the case study approach to make formal generalisations does not undermine its capability as a research method.

Flyvbjerg (2006) also suggests that the issue of researcher bias does not affect case study research any worse than it does in quantitative studies since some level of subjectivity is used in preparing any research. He adds that the advantage case study research has over quantitative research in this regard is that there is greater room to review it in the course of the study to curtail this problem.

### c. Reliability and validity of case study research

Perhaps, the bane of qualitative research is that there is not as yet a consensus on how to establish how such studies are rigorous (Morse et al., 2002). This is not a serious problem for quantitative research because it relies on mathematical models and statistical techniques which makes it relatively easy to match findings with the underlying data (Morse et al., 2002).

Despite this challenge, there are some techniques often considered as the standard tests for rigour in qualitative research (Yin, 2003). These techniques are applied in my work. Yin (2003) lists them as "*construct validity"* (p. 34)*, "internal validity"* (p. 34)*, "external validity"* (p. 34) and *"reliability of the research"* (p. 34). These tests and some actions the researcher must pursue to meet them are outlined in Table 8 below.

Table 8 Some Strategies for Establishing Rigour in Case Studies

| Test | Case Study Tactic | Phase of research which tactic occurs |
|---|---|---|
| Construct validity | 1. Use multiple sources of evidence | data collection |
| | 2. Establish chain of evidence | data collection |
| | 3. Have key informants review draft case study report | composition |
| Internal validity | 1. Do pattern-matching | data analysis |
| | 2. Do explanation-building | data analysis |
| | 3. Address rival explanations | data analysis |
| | 4. Use logic models | data analysis |
| External validity | 1. Use theory in single-case studies | research design |
| | 2. Use replication logic in multiple-case studies | research design |
| Reliability | 1. Use case study protocol | data collection |
| | 2. Develop case study database | data collection |

Source: COSMOS Corporation as cited in Yin (2003, p. 34)

According to Yin (2003), the construct validity determines if the researcher's methods used in gathering data including the type of data to be relied upon, match the objective of the case study. In order to enhance the strength of the data, the researcher may use several forms of data to support each other (Yin, 2003). Yin (2003) lists six common data sources as "*documentation, archival records*, *interviews, direct observation, participant-observation, and physical artifacts"* (Yin, 2003, p. 83). The researcher must also provide an adequate account of the steps or procedures used for gathering the data in a way that shows how the study's findings emerge from the data gathered (Yin, 2003).

For the purpose of my study, the issue of internal validity concerns whether the inferences drawn by the researcher are justified (Yin, 2003). This can be enhanced by ensuring that the empirical work is backed by a strong theoretical framework (Yin, 2003).

External validity considers the issue of generalisation (Yin, 2003). This has been discussed earlier but I add another dimension provided by Yin (2003) where the author states that:

> *"Survey research relies on statistical generali[s]ation, whereas case studies (as with experiments) rely on analytical generali[s]ation. In*

*analytical generali[s]ation, the investigator is striving to generali[s]e a particular set of results to some broader theory" (Yin, 2003, p. 37)*

As indicated in Table 8, the researcher can address this issue by linking the research to theories (Yin, 2003)

Finally, reliability relates to ensuring that the research would not yield different results if it were conducted by a different person in an identical way (Yin, 2003). From Table 8, the measures to ensure reliability relate to adopting the best practices in doing the research (Yin, 2003), some of which have been discussed already.

## 5.2 Data Collection

### a. Ghana

#### i. Pre- fieldwork activities

A fieldwork exercise was carried out in Ghana from August 2018 to November 2018 to gather both primary and secondary data. Since information on Ghana's tuna industry was scanty, I undertook a pre-fieldwork visit to Ghana in 2017 for about a month with the aim of getting acquainted with some industry players and building some contacts for the main fieldwork exercise. In addition, the pre-fieldwork exercise was to expand my understanding of the industry to improve preparations for the fieldwork. Most of the contacts I built were linked to government agencies and research institutions. To the best of my knowledge, only two major studies on Ghana's tuna industry existed at the time of this research - Drury O'Neill (2013) and Asiedu et al. (2015).

The preparations for the fieldwork were done using knowledge from the two studies mentioned earlier, the pre-fieldwork visit as well as from my interactions with other researchers who had done fieldwork in Ghana. I identified the main industry players I wanted to interact with and the type of data I expected from them. I intended to conduct in-person interviews for many of the participants except for a few organisations where I would request for secondary data since they handled such information. All the necessary training and ethical considerations were undertaken before the fieldwork started. Table 9 shows the main categories of participants I planned to interact with and their purpose for inclusion in my study.

Table 9 Main Participants and their Potential Contribution to Fieldwork

| Participant | Purpose |
|---|---|
| Tuna Fishing Firms | The tuna firms would provide me information on their principal activities and how they were integrated into global chains. Additionally, I wanted to know how they developed their technological capabilities to undertake innovation (upgrading) in the industry. Finally, I was concerned with linkage formation between the tuna firms and other firms in the broader economy. |
| Tuna Canneries | |
| Tuna Agencies | The tuna agencies included those whose activities directly affected the tuna industry such as the Ghana Tuna Association, Ghana Standards Authority, Fisheries Commission, trade unions and others. Information from these institutions would provide deeper insights into the tuna industry. In addition, I sought to use the knowledge I got from them to corroborate what I learnt from the tuna firms. |
| Other Manufacturing Companies | I sought to engage some non-tuna manufacturing firms from different industries to broaden my understanding on some of the issues pertaining to the development of their technological capabilities. |
| Non-tuna Agencies | This category of participants included government agencies, business associations and international organisations that could provide more information on the promotion of technological capabilities and innovation in firms in Ghana. This set of participants must be distinguished from the tuna institutions in that they are not tuna-specific institutions even if their activities somewhat affects the industry. Examples of participants in this category are the Ministry of Trade and Industry, the National Vocational Technical Institute, the World Bank and others. |
| Researchers/Experts | I also planned to contact scholars and experts who had extensive knowledge on the major themes of my study. The list of participants in this category included the authors of the two major studies on the tuna industry in Ghana as mentioned earlier. |

Source: Author

I now provide some brief information on some important aspects of the fieldwork under the following sub-headings:

***Location***

The principal locations for the exercise were Accra and Tema as those were where most of the companies, agencies and independent researchers were based. The tuna companies, comprising of both the fishing and processing companies, are all situated in the Tema Export Processing Zone. All the other interviews took place in Accra except for two, that occurred in Kumasi and Sunyani because those were where the participants in question were located. The interviews were carried out in the offices of the respondents. My primary base for the entire duration of the exercise was in Accra.

***Language***

The language used throughout the entire fieldwork exercise was English. The participants from the companies and various agencies were usually at the senior management level and spoke English fluently. Where they supplied written answers, this was also done in English and required no translation. Informal communication with 'ordinary people' who had some knowledge on the tuna industry were sometimes done in Twi, a local Ghanaian language which I was fluent in.

***Consent***

The consent of all participants was expressly sought in writing before any engagement with them commenced. The template of the consent form designed by SOAS, University of London, was used and a copy has been provided in the appendix of this study. All participants were given adequate time to read through the form in my presence and they were required to endorse two copies if satisfied, before the interview started. I was on hand to answer any question they had and would often stress some of the provisions including their right to withdraw their participation at any point during and even after the interview. They were also reminded that they were not obliged to answer any question. For those who opted for written questions, I attached the consent forms to the questions. I did not anticipate the collection of any personal or sensitive information and no such information at any time was solicited or provided by any of the participants. Each respondent kept a copy of the signed consent form whilst I kept the other.

***Research team***

The entire fieldwork exercise was conducted by the author of this study alone. I conducted all the interviews, their transcriptions and subsequent analysis. I only sought the assistance of third parties to help in gaining access to some of the participants. Once I got access, the participant only interacted with me. The main tools I used for the research were an audio recorder to record the interview, a notepad for taking notes and my personal computer. At no point was any form of remuneration or inducement, either in cash or kind, requested, offered or made to any participant. I did not make any specific expense to induce a participant to partake in an interview such as paying for lunch or transportation of the participant. My funding for this exercise was drawn from the financial support I received from my university, SOAS, who are the sponsors of my PhD study.

### ii. Fieldwork activities

I now provide an overview of the fieldwork exercise. I have organised this brief report according to the participants that were engaged with on the field.

***Tuna Fishing Companies***

My original plan involved interviewing all the tuna fishing companies operating in Ghana since their number was relatively small and they operated within a cluster based on my preliminary checks ahead of the fieldwork exercise. I intended to rely on the official list of licensed tuna fishing firms published by the Fisheries Commission of Ghana. Some weeks before the exercise started, Ghana's Fisheries Commission had published the list for the period, January to July 2018. However, by the time my fieldwork started, it had been taken off the website with no replacement (that is, the list for August to December 2018). I made an official request to the Fisheries Commission for the updated list, and it took three weeks before this was granted. The list had fourteen local tuna fishing companies with the postal addresses and the telephone numbers provided for some of them.

However, postal addresses in Ghana (as at the time of the fieldwork) are not necessarily linked to the locations of residential or corporate properties. The telephone numbers attached to some

firms on the list also appeared to be out-dated as they were not working. I resorted to making enquiries from individuals within the Tema Export Processing Zone (EPZ) enclave with regards to the location of the firms. This process was not tedious since the fishing companies operated in proximity, in some cases, even in the same building.

I quickly found that the list I had been provided was out of date. Some of the firms on the list had collapsed whilst others had been acquired by larger ones. There was even a new tuna firm whose name was not on the list. I undertook a reconciliation of the information I gathered on the ground with the list and had twelve tuna fishing firms. This was further whittled down to ten companies after my difficulty in locating two of the firms. My contacts indicated that those firms could potentially be new or defunct leading to their difficulty in identifying them.

I contacted all the ten fishing companies on the list. Two letters were presented to each firm, one requesting for an interview whilst the other was an introductory letter from SOAS, which confirmed my identity as a student at the school. The tuna fishing companies had two directors, one Ghanaian and the other, a foreigner. I was usually directed to see the Ghanaian director when I visited the firms since according to the staff I interacted with, they were the only ones who could authorise and/or partake in the interview.[35] This proved challenging as the directors were usually not present when I visited the office. I was fortunate to be provided the personal numbers of some of them which allowed me to schedule an appointment.

Since it was becoming difficult to meet the Ghanaian directors, given their schedule, I changed my strategy by modifying my interview questions in such a way that written answers could be provided by the respondents. The idea behind this was that, instead of a sit-down interview, which some of the Ghanaian directors or their designated representatives may not have time for, they could answer the questionnaire over a period. In addition, I also switched to written questions because I noticed some apprehension from some respondents over my request for interviews. The change in tactics worked as I experienced an improvement in the response rate. Fifty percent of the fishing firms that were approached participated in the study. For the firms that did not participate, three expressed their outright disinterest. Another informed me that the Ghanaian director was out of the country every time I visited the office and the questions were

[35] The tuna fishing firms are mainly joint ventures comprising of a Ghanaian director and usually a South Korean director with the Ghanaian directors often controlling the administrative aspects of the operations (see Chapter 6 and the discussions on my empirical results).

never answered. For another firm, there was no positive response despite frequent visits and calls.

For those that participated, three of them opted for written questions whilst two did in-person interviews. The full list of respondents in the study, including their mode of participation is provided in the appendix of this study. I also use secondary data to compensate for the limited participation of the tuna fishing firms.

Semi-structured interviews were carried out in the offices of the respondents. The same set of questions were asked of all the tuna fishing firms that participated in this study. However, in-person interviews allowed me to ask follow-up questions depending on the answers they gave. Additionally, in some instances, I used the in-person interviews to corroborate or clarify some issues that had come up in other interviews or from written responses I had received. In designing the questions, I refrained from using technical terms that could appear vague or difficult for the participants to understand. For instance, instead of asking a respondent directly if their firm had undergone functional upgrading, a terminology that may be technical and difficult for the respondent to understand and respond, I enquired whether the firm had undertaken different functions aside their core activities like the tuna fishing firms moving into processing.

Only one of the two in-person interviews was recorded. For the participant who declined the recording of interview, I employed shorthand form of writing to capture the salient points as he spoke. Where I missed a point, I would politely ask the participant to repeat what he had said. The participant was gracious and spoke at a pace that allowed me to write down the answers.

As I indicated earlier, the written questions were only a modified version of the ones asked during the in-person interviews. Since the questions were likely be answered in my absence, without the chance for the respondent to seek further clarification, I aimed to ask very clear questions (see appendix for sample of questionnaire). Sufficient space was provided by each question for the written answer. The drawback of this approach was that it was time-consuming and required the respondent to be proficient in English to answer them.

Despite these potential challenges, this format proved successful as the questions were adequately answered. One respondent even answered the questions in front of me which allowed me to probe some of the answers further.[36]

### *Processing Firms*

I planned to interview all the tuna processing firms in the country. When this study began, there were three processing firms in operation but by the time the fieldwork started in August 2018, the only indigenous firm in the industry, had ceased operations. I contacted the two processing firms for interviews but both preferred written questions. The main reason given was that this would allow them to solicit the responses from different departments in the firm.

Even though I agreed on a time for the collection of the documents (4 weeks), they were not ready by that time, and I had to make frequent visits and calls to both firms. Eventually, Pioneer Food Cannery, (PFC), the larger of the two firms, finally indicated their unwillingness to participate in the study. However, Cosmos Seafoods, took part in the study and returned the answered questions. Like the case of the fishing firms, most of the questions required detailed answers and though the process of answering them could be time consuming, the document retrieved from Cosmos showed that comprehensive answers had been given for the different questions asked. The non-participation of PFC was mitigated by the availability of a significant amount of secondary data including company reports from their parent company as well as newspaper reports and existing studies. In addition, one of my participants in this study had earlier conducted a study on Ghana's tuna industry and had some knowledge on PFC which I could depend on to plug major gaps that could arise from their non-participation in my study. Cosmos Seafoods on the other hand was relatively new in the industry and there was limited secondary data available for them. Thus, their participation in the study was very important.

### *Tuna Institutions*

This term collectively represents the state agencies regulating the activities of the sector. In addition, this category captures several associations including the fishermen association and

[36] I went to his office expecting to pick up the answered questions (as had been agreed earlier) but the respondent only started to answer the questions upon my arrival. I could not take advantage to conduct an interview as I had not anticipated it and made no preparations for it.

the Ghana Tuna Association. Interactions with these respondents were by way of interviews, which took place in their offices. The questions were wide ranging, and I sought to verify some of the responses gathered from the tuna companies. For the Ghana Tuna Association, the representative I spoke to also happened to belong to a tuna fishing company. Therefore, the interview questions covered both the activities of his firm and the tuna association. Unlike the tuna companies, I had easier access and cooperation from these agencies.

Many agencies had an efficient procedure for dealing with researchers and once the request was made for an interview, it did not take long for a resource person to be made available and an interview date scheduled. Interviews were mainly conducted with senior officials of the agencies. There did not appear to be efforts to withhold information. In fact, for some agencies, more than one resource persons were provided in a bid to deepen the discussions. The interviews were mostly in a relaxed atmosphere.

***Non-Tuna Manufacturing Companies***

My research contacted non-tuna manufacturing firms in the country to broaden my knowledge on issues relating to technological capabilities, innovation and structural transformation in the country. In addition, this gave me the opportunity to identify common or unique problems that were faced by manufacturing firms in the country. It also allowed me to corroborate or clarify some of the answers from the tuna companies. Given the scope of the study and the limitations I faced, including time constraints, I planned to interview only a few firms.

Originally, I intended to use the database of the Association of Ghana Industries (AGI) to create a small sample. After continuous visits to their office, I was given an excel file containing a list of many companies. This list proved unhelpful as it did not provide enough information on the firms to assist in choosing my sample. I then resorted to the database of firms registered with the Ghana Export Promotion Authority (GEPA) (published on their website). These were mainly firms that produced for export. I gave preference to agro-processing firms that were based in Accra because of the logistical constraints in dealing with firms scattered across the country. Also, agro-processing firms would provide knowledge that would allow me to examine their linkages with the tuna industry. My initial list, based on GEPA's database, covered most of the agro-processing firms based in Accra. Based on my eexperience with the

tuna firms, I developed written questions as my limited time for the fieldwork would not permit me to be chasing interviews for long.

Despite this, the challenges with dealing with companies in Ghana re-emerged. On most occasions, the companies appeared non-cooperative once I informed them about my mission. I would often be asked to leave the questions and other associated documents (example consent form) at the reception and make follow up visits or telephone calls. The follow ups yielded very little, and it became increasingly clear that the questions were not being acted upon. In some cases, I even had to present the documents to the same firm twice. Some firms, after several visits, expressed their disinterest in the study and although some others did not openly declare their reluctance, I stopped paying visits after a while to concentrate on other aspects of the fieldwork.

Since I was having difficulty reaching the firms on my list, I resorted to using local contacts to connect with individuals in manufacturing companies to explain my project to them and have them assist me in either securing interviews or have my questions answered. The main disadvantage of this strategy was that I had to expand my list of firms to include non-agro processing manufacturing firms. My final list had sixteen (16) firms from various industries including agro-processing, pharmaceuticals and plastics. Although this strategy looked promising, the response rate was quite low with just about thirty percent (30%) returning the answered questions.

***Non-tuna institutions and individual researchers/experts***

This category of participants included those organisations that had knowledge on the different themes in my study like innovation and structural transformation such as the Ministry of Trade and Industry, the World Bank and others. Like the case of the tuna agencies, these participants were cooperative and access to them was straightforward. In a few instances, interviews were granted on the same day that initial contact was made. I had situations where some participants recommended others that would be useful to my study and even went ahead to arrange interviews with them on my behalf. The cooperation of these agencies allowed me to complete this set of interviews over a short period, including conducting two interviews on the same day on some occasions. This afforded me sufficient time to continue with my visits to the

companies that were proving difficult to access. Some researchers who were unavailable at the time of my fieldwork were open to interviews being carried out on skype when I returned to London.

The researchers included those that had done some work on Ghana's fisheries, Ghana's tuna industry, structural transformation and the development of technological capabilities of Ghanaian workers. The authors of the two studies on the tuna industry cited earlier were both interviewed. The interviews were very useful and helped fill several gaps that had been identified.

**b. Thailand**

I did not conduct a fieldwork exercise in Thailand because of logistical and time constraints. However, since there was significant amount of secondary data on the industry, I was confident of getting enough data for my analysis. The sources of data I used included the websites of the companies, company reports, previous studies and online materials such as news reports.

The database I used to identify the Thai tuna firms was from the Thai Tuna Industry Association which contained the Thai canneries and some of their suppliers.[37] The websites for the tuna firms were provided by the association. In some instances, subsidiaries shared the same website as their parent firms. Most of the websites of the selected firms had English translations of their contents and they only required the user to switch from Thai to English. A few websites did not have this feature and in those cases, the Google Chrome browser, which has a translation feature, was used to translate the contents to English. Even though this was not an official translation, it was still coherent and useful. The firms that were excluded from the study were those whose websites were unavailable, did not display sufficient information useful to this study, or those whose websites were broken (I made multiple checks on those websites for an extended period to see if there were improvements, but the situation did not change). Information on the firms examined is provided in Chapter 6 of this study.

[37] Tuna fishing activities in Thailand is very low and so I focused mainly on the processing firms (see Chapter six (6) for more).

The websites of the firms mostly included information on their history, their activities, their products, their clients, the structure of the companies among others. For some of the firms, particularly those that are public companies, they supplied company reports and other financial data. I also relied on official reports and websites of the business associations and government agencies in Thailand for my study.

## 5.3 Data Analysis

I used the NVIVO software to assist in the organisation and analysis of my data. I transcribed the interviews and sought to reconcile the written answers with the transcript of the interviews. Summaries of the responses were also extracted and arranged under broad headings. This was to provide a quick overview of the research results.

In extracting the information on Thailand, the same headings were used and additional information collected to provide further understanding. In this way, a comparison of the industries in both Ghana and Thailand could be properly done. The comparative analysis done with the data on both Ghana and Thailand enriched the depth of the analysis, providing an important context for the findings made in Ghana.

### *Challenges*

Some of the limitations of this study relate to the non-cooperation of some of the firms in Ghana in the study. Although the study has sought to fill the gaps using information from other sources, there is no doubt that the increased participation of the firms would have enriched the analysis. Additionally, my inability to interact directly with the Thai firms, owing to logistical constraints, is a significant weakness of this study.

## 5.4 Conclusion

In this chapter, I have examined the methodology used for my empirical work. I have stated that as a result of the nature of my research enquiry, which is aimed at explaining how innovation in GVCs occur, qualitative research, specifically a case study approach, is best suited for my exercise. I have shown that contrary to the prevailing arguments against the

robustness of case studies as a tool for research, they offer rich perspectives into an issue and can be as thorough as quantitative research.

I have followed these arguments with a report on my data collection procedures and activities to demonstrate the quality of my research. I have also stated specific challenges I faced on the field and how I overcame them. The results of my studies are discussed in the subsequent chapters. First, I provide an overview of the tuna industries of Thailand and Ghana in the next chapter.

# Chapter Six

## Overview of the Tuna Industries of Ghana and Thailand

### 6.0 Introduction

This chapter forms the first component of my empirical study and contains an overview of the tuna industries of Ghana and Thailand. This provides a useful background for the discussions in Chapters 7 and 8.

Since my study aims to examine linkages to ascertain whether knowledge diffusion is stimulated by insertion into GVCs, my discussion of the tuna industries in this chapter is nested within the broader fisheries and agro-processing sectors in Ghana and Thailand (since the tuna industry comprises of both the primary and secondary sectors). Therefore, I also discuss the historical development and the current state of the fisheries and agro-processing sectors of both countries.

The rest of the chapter is structured as follows: in Section 6.1, I provide an overview of the fishery sectors of Ghana and Thailand by highlighting their historical development and examining their current structure. Also, I briefly discuss Ghana and Thailand's international trade in fish and fishery products. My analysis then shifts from the general fishery sector to the tuna fishing sector specifically. However, this exercise is only carried out for Ghana because its domestic tuna production plays a greater role in its tuna industry. By contrast, Thailand's domestic tuna fishing firms are not major players in its local tuna industry (Hamilton et al., 2011; The Asia Foundation and ILO, 2015).

In Section 6.2, I deliberate on the evolution of agro-processing industries of Ghana and Thailand. I then specifically assess the tuna processing sectors of the two countries where I discuss their origin and their current market structures. I examine the powerful firms in their respective industries, their products and how they are integrated into GVCs.

My concluding remarks are contained in Section 6.3

## 6.1 Fisheries Sector

### a. Thailand

Thai fishers previously exploited fishery resources within and outside their maritime borders, spanning vast areas when countries had not declared their Exclusive Economic Zones (EEZ) (Boonchuwongse and Dechboon, 2003). Today, they mainly operate within their territorial waters of over 400,000 km$^2$ (Janetkitkosol et al., 2003).

Figure 9 below shows a map of Thailand depicting its water resources. There are two main water bodies - the Gulf of Thailand and the Andaman Sea (Janetkitkosol et al., 2003).

Figure 9 Thailand's Territorial Waters

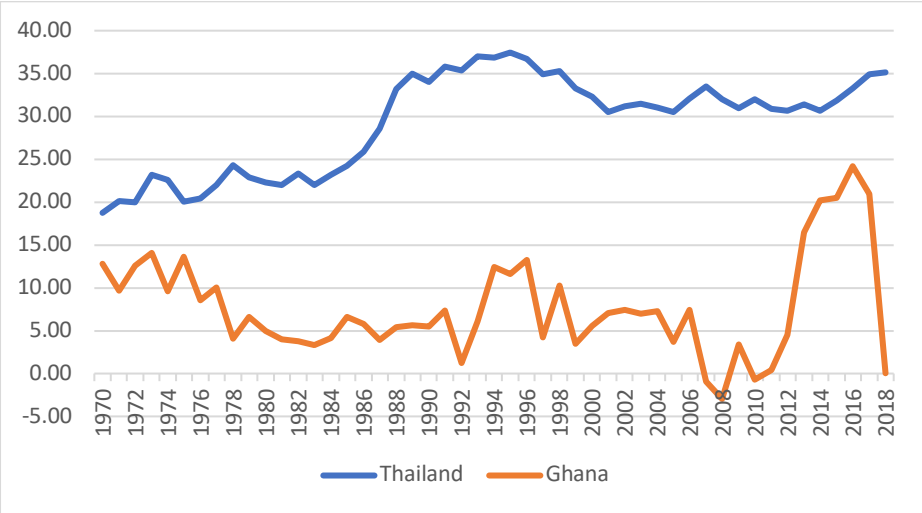

Source: UN (2009)

### i. Development of marine fisheries

According to Boonchuwongse and Dechboon (2003) and Panaĭotov and Jetanavanich (1987), the Thai fishery sector transformed from a basic one into a successful commercial venture following the introduction of more productive and complex fishing vessels. The high returns from fishing due to its mechanisation soon caught the attention of investors in Bangkok (Panaĭotov and Jetanavanich, 1987). Their investments were spurred by Bangkok's better infrastructure, financial system and technology (Panaĭotov and Jetanavanich, 1987).

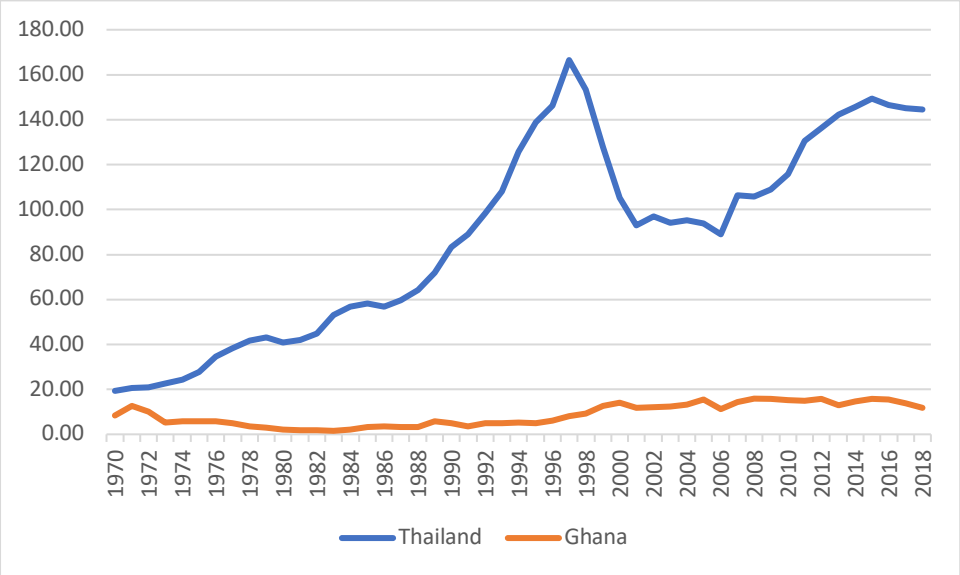
An examination of Thailand's data on savings and supply of credit to businesses, which are provided in Figures 10 and 11 respectively, provides a picture of the depth of the country's investor base. In Figure 10, the gross domestic savings (as a percent of GDP) in Thailand experienced sustained increase from the 1970s up until the middle of the 1990s. Figure 11 shows that the domestic credit to the private sector also moved in line with the increase in savings, experiencing a steep rise to peak in 1997, at 167 percent of GDP.

Figure 10 Gross Domestic Savings (Percent of GDP)




Source: Author's illustration using data from World Bank (2021)

Figure 11 Domestic Credit to Private Sector (Percent of GDP)

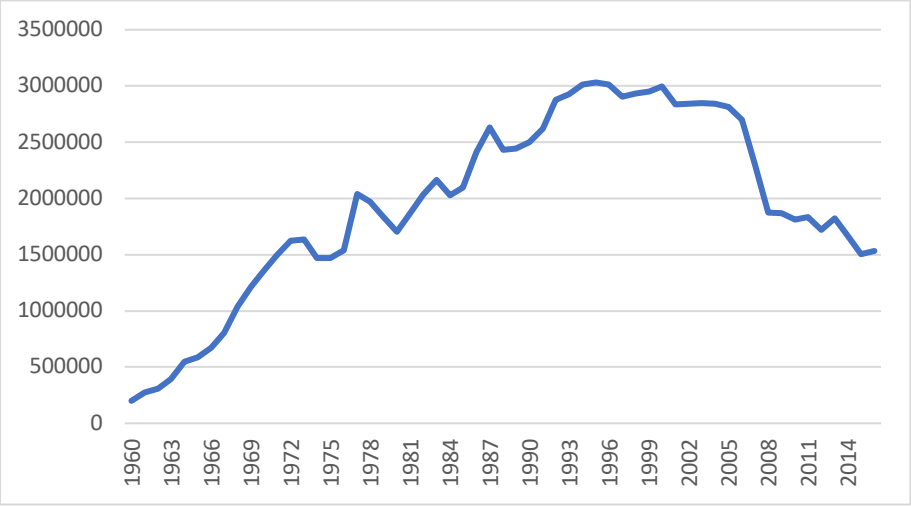



Source: Author's illustration using data from World Bank (2021)

### ii. Fisheries Production

Figure 12 below shows the output (capture fisheries) of the Thai fishers. The graph indicates that catches generally rose steadily from the 1960s where the country was producing less than 500 thousand metric tons of fish to the middle of the 1990s, producing over 3 million metric tons of fish. Since then, production has been falling, reaching the 1970s level.

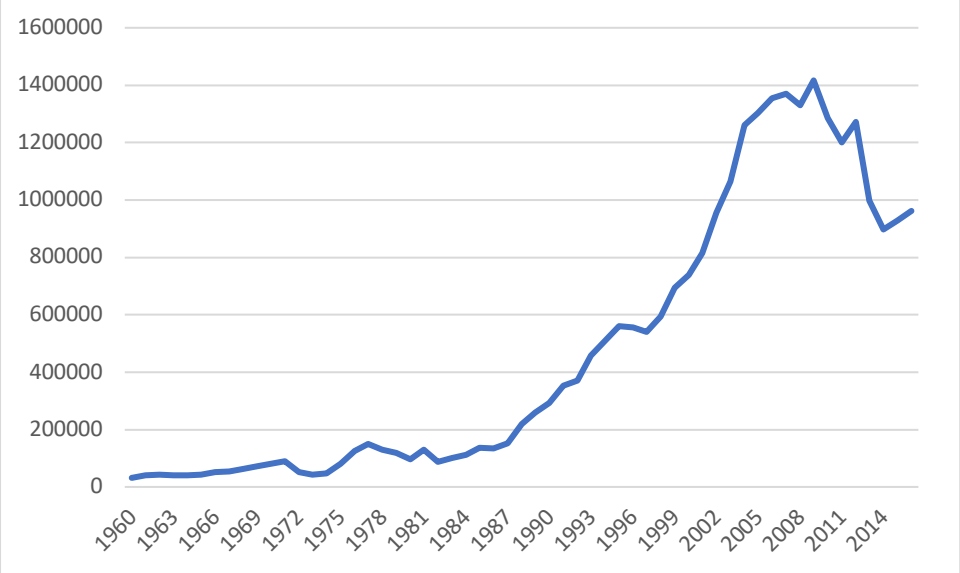
Figure 12 Thailand Capture Fisheries (metric tons)[38]




Source: Author's illustration using data from World Bank (2021)

Apart from capture fisheries, Thailand is also an important player in aquaculture production with the sector accounting for almost 40 percent of its total fish output in 2016 (Food and Agriculture Organization, 2019). Figure 13 below shows the growth of aquaculture production in Thailand. Production increased steeply in the 1990s and peaked in 2009 at over 1.4 million metric tons.

Figure 13 Thailand Aquaculture Production (metric tons)




Source: Author's illustration using data from World Bank (2021)

[38] The World Bank (2021) defines capture fisheries as "*the volume of fish catches landed by a country for all commercial, industrial, recreational and subsistence purposes*".

### *Tuna Production*

Tuna production in Thailand is low despite the country's position as the most important tuna processing and export nation (Hamilton et al., 2011; The Asia Foundation and ILO, 2015). The tuna processors mainly import their tuna raw material (Hamilton et al., 2011; The Asia Foundation and ILO, 2015). In Chapter 4, I discussed the operations of the trading companies serving the Thai canneries and it can be inferred from that analysis that due to the huge size of the operations of the trading companies, local Thai tuna fishing firms face stiff competition from trading companies which will inevitably reduce their margins.

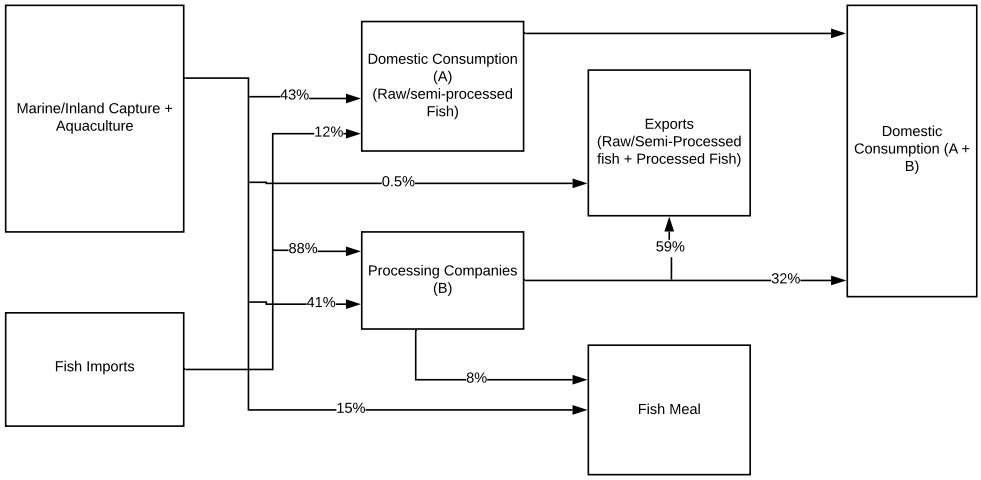
In any case, it is possible that the regulatory conditions covering tuna production may reduce the motivation for Thai investors to move into tuna production. I do not delve deeply into the Thai tuna fishing sector in this study based on their limited role in the country's tuna industry.

## iii. International trade in fisheries

Before examining Thailand's trade in fish, I first discuss how it utilises fish it produces or imports. I conduct this analysis using Laowapong (2011)'s schematic diagram of the process, which is presented in Figure 14 below. The chart shows that most of the locally produced fish are either directly consumed (43 percent) or processed (41 percent). In addition, the graph indicates that the country supplies less than 1 percent of its raw fish output to foreign buyers.

The rest of the locally produced fish (about 15 percent), according to Figure 14, goes into the production of fish meal. Figure 14 also demonstrates that Thailand mostly imports fish as raw materials for its canneries (88 percent). Since only 12 percent of the imported fish goes into direct consumption, it can be argued that Thailand is relatively self-sufficient in the production of fish for direct consumption. Most of the processed fish are exported (about 60 percent) whilst over thirty percent (30 percent) are sold locally. The chart indicates that the remaining processed fish is used as fish meal.

Figure 14 Overview of Thailand's Fish Utilisation (2010)




Source: Adaptation of Laowapong (2011)

With regards to its international trade in fish, Figure 15 below suggests that Thailand is a net exporter of fish. As has been suggested, whilst Thailand mainly imports raw fish for local processing, it predominantly exports processed fish products which implies that the country extracts a higher value from its fishery resources compared to countries that export raw fish.

Figure 15 Thailand Fish Trade Statistics (USD 1000)


Source: Author's illustration using data from Food and Agriculture Organization (2019).

### b. Ghana

Ghana's EEZ is about 225 000 km$^2$ (Nunoo et al., 2014), which is about half the size of that of Thailand. Figure 16 below provides a graphical outline of Ghana's coastal waters.

Figure 16 Ghana's Territorial Waters


Source: United Nations (2005)

A significant proportion (about 70 percent) of Ghana's local fish supply is sourced from the country's marine waters (Ashitey, 2019; Tall and Failler, 2012) comprising of both pelagic and demersal fish (Tall and Failler, 2012). The small pelagic fish, which dominates the marine fish

output (about 60 percent (Ashitey, 2019)), is made up of species like mackerels, sardines and anchovies whilst tuna is the predominant large pelagic fish (Ashitey, 2019; Tall and Failler, 2012). Given the importance of marine fishing in Ghana, I mostly focus on that in this section.

### i. Development of the Ghana's Marine Fisheries

According to Lawson (1968), who provides an insight into the initial stages of the development of Ghana's fisheries, the sector experienced low productivity owing to the use of basic fishing gears by the fishermen. This provoked efforts by the state to transform the sector into a commercial one by conducting research into the availability of fish resources (Lawson, 1968). According to the author, with the aim of stimulating the industrialisation of the fishery sector, the state experimented with Ghana's first modern fish vessel in 1953. The trial was successful and to widen the scope of the project, the government instituted a partnership scheme, where the state would lease the commercial vessels to the fishermen, who then fully owned it after paying it off (Lawson, 1968).

This led to about 150 fishermen ditching their canoes for the more productive fishing vessels (Lawson, 1968). In addition, local investors outside fisheries were also attracted by the sudden high profitability in fisheries as a result of the programme (Lawson, 1968). However, the high number of participants put pressure on the limited stocks of fish and coupled with the fact that most of the fishermen struggled to manage the new vessels, profits rapidly collapsed, causing many participants to default and bring the 11-year programme to an end by 1963 (Lawson, 1968).

Although the programme was short-lived, the author notes that it led to a momentary dominance of Ghana's commercial fisheries by indigenous fishers and investors leading to the rise of powerful fishing companies like Mankoadze Fisheries (Lawson, 1968). The fishing company ventured into the manufacturing of mackerel and herring after establishing Pioneer Food Cannery (PFC) in 1972 (Sutton and Kpentey, 2012).

As Ghana's fish stocks weakened rapidly, the country's commercial fisheries also crumbled, deepening the use of artisanal gears for fish harvesting (Connell, 2001). In Chapters 7 and 8, it

will be demonstrated that Ghana's mechanised fisheries sector is dominated today by foreigners even though the tuna sector appears better regulated than the industrial trawl sector.

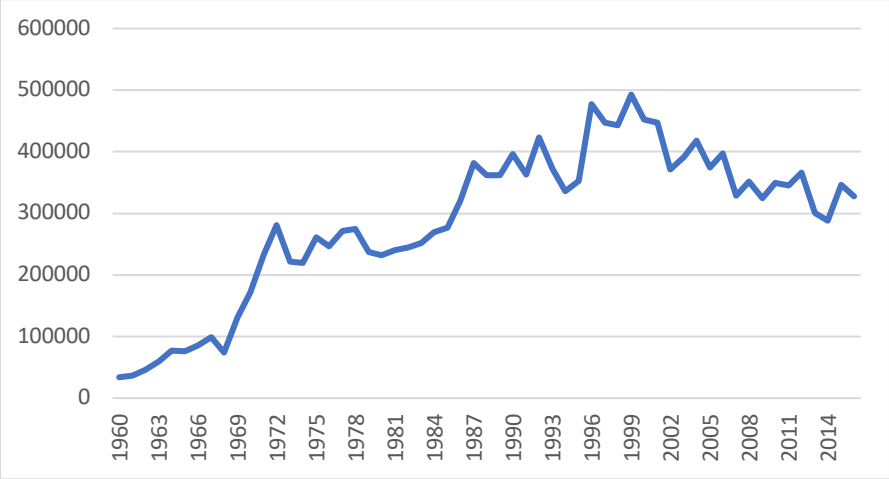
### ii. Ghana Fisheries Production

Ghana's marine fisheries can be categorised into three - artisanal, semi-industrial and industrial (Ashitey, 2019). The artisanal sector, whose output usually comprises the small pelagic fish, dominates the country's marine fish output with about 70 percent of the catch (Ashitey, 2019). More than 20000 canoes are in use in the artisanal sector (Ashitey, 2019). The semi-industrial segment, which uses bigger boats, targets demersal fish although they also harvest small pelagic fish whilst the industrial sector produces tuna (Ashitey, 2019).

With regards to inland fishing, the Lake Volta is the most important water resource, responsible for 70 percent of output from the sector (Ashitey, 2019). Some of the fish produced from inland sources include tilapia, catfish, mud skipper, crabs, shrimps and oyster (Ashitey, 2019).

Figure 17 below provides data on Ghana's capture fisheries. The chart shows that total production of capture fisheries generally rose from the 1960s until 1999 when production peaked at almost 500 thousand metric tons. The graph also demonstrates that the country's fish production has been declining since 1999. Since 2010, capture fisheries in Ghana have averaged at 330 thousand metric tons which is similar to production levels in the 1980s (World Bank, 2021). The fall in output is on account of overfishing (Ashitey, 2019).

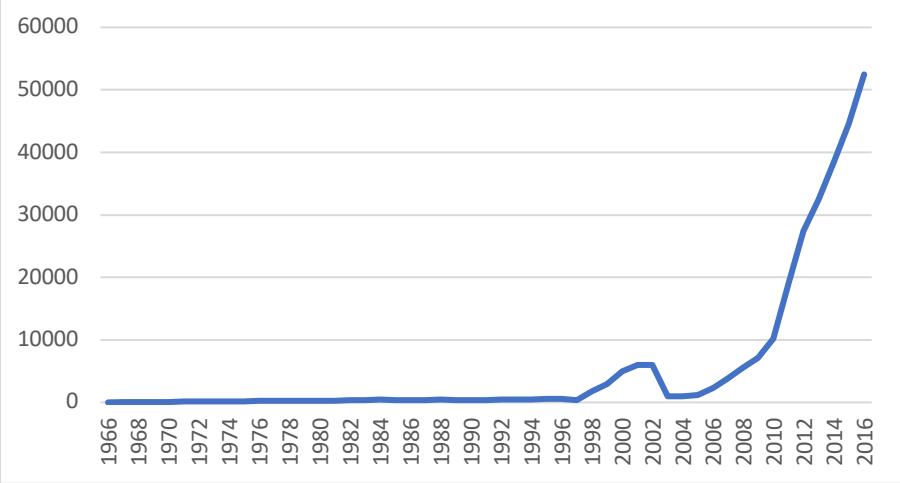
Figure 17 Ghana Capture Fisheries (metric tons)




Source: Author's illustration using data from World Bank (2021)

Figure 18 below shows Ghana's output in aquaculture. The chart indicates that production was significantly low in the 1990s and only experienced continuous strong growth from 2010 even though the output levels fall far short of Thailand's. Tilapia and catfish account for 80 percent and 20 percent respectively of the output in this sector (Ashitey, 2019).

Figure 18 Ghana Aquaculture Production (metric tons)




Source: Author's illustration using data from World Bank (2021)

### *Tuna Production*

By Ghanaian law, tuna vessels must have a Ghanaian owning at least 50 percent of its stake and the crew must consist of not less than 75 percent of local workers (Fisheries Act 625, 2002).

My fieldwork activities indicate that currently, there is no wholly Ghanaian owned tuna fishing company and most of the foreign investors operating in the tuna industry are South Korean.

Table 10 below provides information on the Ghanaian tuna fishing companies. The data indicates that Panofi is by far, the market leader, capturing almost 60 percent of the market. The table demonstrates that the company owns the most powerful fleet both in terms of number of vessels and the type (since they are all purse seines). The company also possesses reefers (Silla, 2020). Table 10 also shows that at least, two of the purse seines are just about ten years old and when compared to the ages of the vessels of its competitors, it implies the company has modern gears. Panofi is bankrolled by the South Korean conglomerate, Silla, which formed the company in a joint venture in 2002 (Silla, 2020). Silla also has stakes in Cosmos, a tuna cannery in Ghana (Seaman, 2018).

I learnt via the grapevine, whilst on fieldwork, that Panofi had acquired Asante Fisheries which would further expand the company's fleet and market share. Some notable fishing companies apart from the market leader include Agnespark and DH with 9 percent and 8 percent market share respectively. TTV, previously owned by Thai Union, has now been sold off (Thai Union, 2020) although information on its new owners is difficult to come by. Informal discussions I held suggested that the new owner was a new fishing firm called Africa Stars but this could not be confirmed as the company refused to participate in my study and the information was not corroborated by other respondents.

Table 10 Overview of Tuna Firms in Ghana

| Fishing Company | No. Of Active Vessels | Vessel Name | Vessel Type | Age Of Vessel (Years) | Market Share | Type of Firm | Nationality of Foreign Investors |
|---|---|---|---|---|---|---|---|
| Panofi Company Ltd | 6 | PANOFI DISCOVERER | PS | 10 | 59% | Joint Venture | South Korea |
| | | PANOFI FORE RUNNER | PS | … | | | |
| | | PANOFI FRONTIER | PS | 32 | | | |
| | | PANOFI MASTER | PS | 31 | | | |
| | | PANOFI PATHFINDER | PS | 10 | | | |
| | | PANOFI VOLUNTEER | PS | 35 | | | |
| Asante Fisheries | 2 | SANKOFA | PL | 36 | 2% | N/A | N/A |
| | | MADANFO | PL | 30 | | | |
| AFKO Fisheries Company Ltd | 1 | YOUNG BOK | PS | 48 | 3% | Joint Venture | South Korea |
| | | AFKO FOODS 803 | PL | 45 | | | |
| | | AFKO FOODS 805 | PS | 38 | | | |
| TTV LTD | | | | | 7% | N/A | N/A |
| Trust Allied Fishing Company | 2 | TRUST 77 | PL | 44 | 2% | Joint Venture | South Korea |
| | | TRUST 79 | PL | 42 | | | |
| RICO | 2 | RICO UNO | PL | 46 | 3% | Joint Venture | South Korea |
| | | RICO SIETE | PL | 45 | | | |

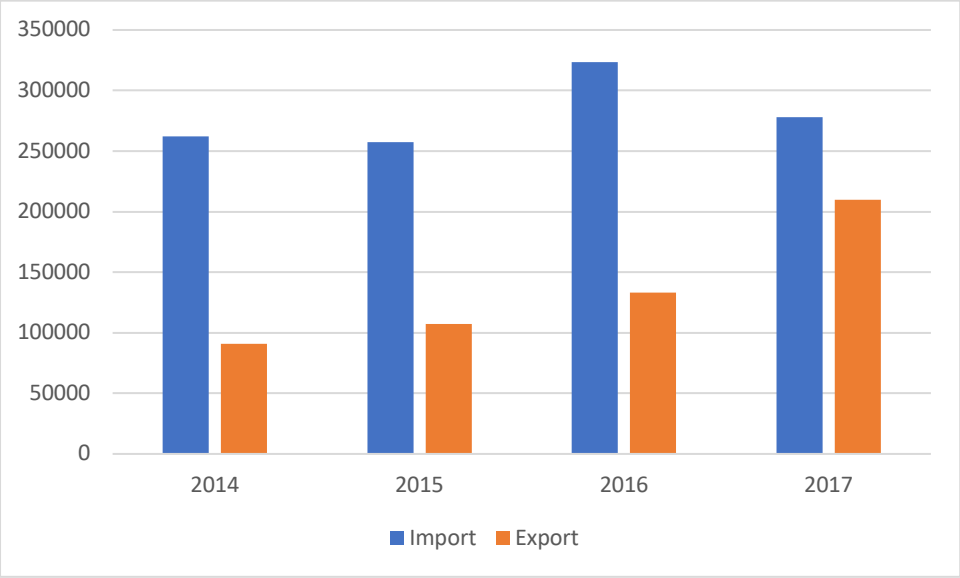
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| GL Fishing Company | 1 | ACE ONE | PL | … | 1% | joint Venture | South Korea |
| Agnespark Fishing | 2 | AGNES 1 | PS | 45 | 9% | Joint Venture | South Korea |
| | | AGNES 11 | PL | 46 | | | |
| World Marine | 2 | MARINE 711 | PL | 45 | 4% | Joint Venture | South Korea |
| | | MARINE 707 | PL | 44 | | | |
| BSK | 1 | AP 703 | PL | 45 | 2% | Joint Venture | - |
| DH | 4 | SEAPLUS 87 | PL | 44 | 8% | Joint Venture | - |
| | | SEAPLUS 89 | PL | 44 | | | |
| | | IRIS-S | PS | 37 | | | |
| | | IRIS-J | PS | … | | | |
| LAIF Fisheries Company Ltd | 4 | AFKO FOODS 802 | PL | … | 1% | Joint Venture | - |
| | | AFKO FOODS 801 | PL | … | | | |
| | | LONG TAI 1 | PS | 30 | | | |
| | | LONG TAI 2 | PS | 29 | | | |

Source: Ghana's Fisheries Commission (data supplied directly to author) for names of companies, vessels and calculation of market share. International Commission for the Conservation of Atlantic Tunas (2019) for types of vessels and vessel names; Table 2.A of Drury O'Neill (2013. p 113) for calculation of age of vessels (as at 2019). Data on type of firm and nationality of investors from empirical study.

### iii. International Trade

According to Ashitey (2019), Ghana's consumption of fish is almost double that of the West African average at a per capita rate of 26 kilogrammes. However, domestic production only supplies about 52 percent of the country's demand for fish causing a reliance on imports to make up the shortfall of 48 percent (using 2018 figures) (Ashitey, 2019). Figure 19 below depicts Ghana's net import position relative to its international trade in fish. Ghana's main fishery export is tuna (Ashitey, 2019).

Figure 19 Ghana Fish Trade Statistics (USD 1000)




Source: Author's illustration using data from Food and Agriculture Organization (2019).

## 6.2 Agro-Processing Activities

### a. Thailand

### i. Development of the Thai agro-processing industry

Discussions over the growth of the Thai agro-processing industry must be linked to its agricultural sector since according to Pongpattanasili (2004) and Murray (2007), the latter plays a significant role in the supply of raw materials. Indeed, according to Saigosoom (2012), Thailand's food sector buys over 80 percent of its inputs from local suppliers.

The development of Thailand's agro-processing sector can be attributed to two major factors: 1) favourable domestic and external conditions and 2) efforts to spur investments in agro-processing and raise the capacity of firms. In terms of the favourable conditions, Pongpattanasili (2004) mentions the growing incomes of Thai and other Asian consumers coupled with their preference for more sophisticated food products. In addition, Thailand benefitted from a boost in global demand for food that created a large market for its food exports (Kohpaiboon, 2006). Although the conditions mentioned so far are not peculiar to Thailand, the country is only one of the few that managed to take advantage of them (Kohpaiboon, 2006).

This can be explained by some of the specific actions undertaken to improve the strength of the country's agro-processing industry. One of such measures has been the Thai government's efforts at encouraging investments into the industry through the use of measures like tax reliefs (Kohpaiboon, 2006). Furthermore, Saigosoom (2012) argues that the foreign investors from countries like Taiwan and Japan raised the technological capabilities of the local firms. In addition, the Thai Food Processors Association, formed in the 1970s, was instrumental in improving the capacity of the local firms to produce to the standards of their foreign buyers (Thai Food Processors Association, 2020b). These actions were supported by some state agencies who partnered with foreign experts to enhance the capabilities of the Thai producers (Saigosoom, 2012).

**Tuna Processing Industry**

The Thai government's investment drive mentioned earlier promoted the emergence of the tuna industry (Crough, 1987; Hamilton et al, 2011). The first Thai tuna cannery, created in 1972, was a partnership between Thai and Australian investors (Corey, 1990; Crough, 1987). According to Corey (1990), Hamilton et al (2011) and Kuldilok (2009), some of the existing agro-processing firms also expanded into tuna manufacturing.[39]

The expansion of Thailand's tuna processing industry was stimulated by: 1) adequate infrastructure supporting industrial activities (Crough, 1987); 2) the country's proximity to the Indian and Pacific Oceans, giving it access to large volumes of tuna imports (Crough, 1987;

[39] This issue is explored in Chapter 8.

Hamilton et al., 2011) and 3) "*a low cost and highly productive labour force*" (Hamilton et al., 2011, p. 159). Thailand's tuna processing industry also benefitted immensely from their collaboration with tuna producers in the United States who were outsourcing their processing activities to Thai canneries (Crough, 1987; Corey, 1990; Hamilton et al., (2011)).

Table 11 provides an overview of some of the tuna processing firms in Thailand which were examined for this study. The table depicts two large firms accounting for 60 percent of market share (in terms of output) whilst about four medium scale firms control less than 10 percent of market share each (The Asia Foundation and ILO, 2015). The smaller firms tend to control less than 5 percent of the market share (The Asia Foundation and ILO, 2015).

Table 11 Overview of Some Selected Tuna Processors in Thailand

| Company | Main Activity | Location | Main Markets | Market Share |
|---|---|---|---|---|
| Thai Union | Seafood processing; frozen seafood; petfood | Samut Sakhon | Thailand, USA, Japan, Europe | 35% |
| Sea Value | Seafood processing; frozen seafood; petfood | Samut Sakhon (2); Nakomprathom (1) | Thailand, USA, Japan, Europe | 25% |
| Chotiwat Manufacturing | Seafood Processing; Petfood | Songkhla | … | 10% |
| Southeast Asian Packaging & Canning | Seafood Processing; Petfood; chicken, soups/sauce, manufacturing cans | … | … | 6-8% |
| Asian Alliance International | Tuna Processing; frozen seafood; Petfood; feed and distribution | Samut Sakhon | Middle East | 6-8% |
| Pattaya Food | Seafood Processing; Petfood; chicken | Samut Sakhon (tuna processing); Vietnam (Shellfish) | Thailand, Vietnam, France, China | 6-8% |
| MMP International | Seafood Processing; Petfood | Samut Sakhon | North America, Europe, Australia, Israel, Saudi Arabia | 3-4% |
| Siam International Food | Tuna Processing; Petfood | Songkhla | | 3-4% |
| S.K. Foods | Seafood Processing | Samut Sakhon; Chaimongkol | Japan, Middle East, Australia, USA | 3-4% |

| | | | | |
|---|---|---|---|---|
| S.P.A International Food Group | | Nakhon Pathom | Thailand, Middle East, | 3-4% |
| Tropical Canning Public | Seafood Processing; Petfood | Songkhla | … | 3-4% |
| AEC Canning | Seafood Processing | Samut Sakhon (Head office); Rayong Province (factory | Thailand, Middle East, Africa & Asia | … |
| ABD Khan | Seafood, Fruit & Vegetable Processing; Processing machine (canned food) supplier | Bangkok (Head office); Kanchanaburi (Factory) | … | … |
| Diamond Food Product | Tuna Processing | Samut Sakhon | Thailand, Middle East, Mali, Malaysia, Hong Kong, Panama, Dominican Republic, Chile | … |
| Premier Canning | Seafood Processing; Seasoning/Sauce Products | Samutprakarn | Thailand, Japan, Middle East, Europe | … |

Source: Author based on data on website of firms and Table 9 of The Asia Foundation and ILO (2015, p. 53) for the data on market share. Seafood processing implies that the firm undertakes processing of other fish apart from tuna.

I now focus on Thai Union, the world's largest canned tuna producer (The Asia Foundation and ILO, 2015) to demonstrate how some of the Thai canneries emerged as powerful tuna firms.

### *Thai Union*

Thai Union started as a family business after Kraison Chansiri, a fishmonger, purchased a tuna cannery in 1977 (Encyclopedia, 2020). With Chansiri and his son running the company, the firm specialised in the processing of small sized tunas and soon began producing for American tuna companies when the latter began outsourcing tuna production to Thai canneries (Encyclopedia, 2020).

In 1994, the company joined the Thai stock exchange (Pananond, 2013; Thai Union, 2020). Then in 1997, it partnered with investors to purchase Van Camp Seafoods, which then made Thai Union, the owners of the Chicken of the Sea brand (Fundinguniverse.com, 2020;

Pananond, 2013; Thai Union, 2020). The company's next major purchase was MW Brands, which afforded it ownership over household tuna brands such as John West, Petit Navire, Parmentier and Mareblu (Campling, 2012; Pananond, 2013; Thai Union, 2020).

Today, Thai Union owns about 14 brands across different seafood product lines such as tuna, sardines as well as petfood (Thai Union, 2020). Most of its exploits into new markets has come by way of purchases of existing seafood companies (Pananond, 2013; Thai Union, 2020). The company also owns production facilities in about 13 countries including its PFC factory in Ghana (Thai Union, 2020).

### b. Ghana

#### i. Development of the Ghanaian agro-processing industry

In order to provide a background to the state of Ghana's agro-processing industry today, it is necessary to briefly discuss Ghana's history of industrialisation. Ghana embarked on an import substitution industrialisation agenda in the 1960s which resulted in a proliferation of state-controlled companies across several industrial sectors (Ackah et al., 2014; Amankwah-Amoah and Lu, 2019). Some of the sectors that received government attention included the textiles and aluminum industries (Quartey, 2006). According to Kraus (1991), the revenues from cocoa, timber and gold were used to sponsor the ISI programme. However, the development of the manufacturing sector was done at the expense of agriculture as the state used its resources to prop up the industries it had established (Steel (1972) cited in Ackah et al., 2014)

The government's industrialisation strategy failed due to a combination of domestic and external factors, some of which are: 1) falling commodity prices and rising budget deficits (Kraus, 1991) and 2) political instability and corruption (Ackah et al., 2014). The failure of the ISI regime and the subsequent macroeconomic instability drove the country into the hands of the IMF and World Bank under the Structural Adjustment Programmes (SAPs) which led to the liberalisation of the economy (Ackah et al., 2014; Kraus, 1991). The liberalised economy fostered an influx of cheap imports which made local substitutes uncompetitive (Ackah et al., 2014).

According to Ackah et al (2014), by the early 2000s, the country's focus was "*stabili[s]ing the economy and laying the foundation for sustainable, accelerated and job creating agro-based industrial growth*" (p. 8). The authors argue that the government's development strategy targeted a "*private sector-led industrial production*" (p. 8).

However, based on Amankwah-Amoah and Lu (2019)'s review of entrepreneurship in Ghana, it can be argued that by the 2000s, indigenous entrepreneurs had been weakened to the point where they were incapable of sufficiently playing the role envisaged by the government in its agro-based industrialisation agenda. According to Amankwah-Amoah and Lu (2019), prior to and even after independence, Ghana's entrepreneurial class has been consistently sidelined and, in some cases, even stifled. Under colonialism, they were cast aside by the British authorities, who were mostly interested in supporting only their commercial interests (Tangri 1998 cited in Amankwah-Amoah and Lu 2019). Even after independence, when Ghanaians became the rulers, the entrepreneurial class was not at the forefront of the country's industrial development as the state took charge of industry (Amankwah-Amoah and Lu, 2019). The authors describe the damage done to the entrepreneurial class under the country's ISI regime in this way:

> *"To sum up, entrepreneurial efforts and activities were hampered by the 'leftist nationalism' championed by Kwame Nkrumah which entailed the rampant promotion of state-owned enterprises and the advancing roles of the state. Entrepreneurial development was also handicapped by earmarking of sectors and state-owned enterprises"* (Amankwah-Amoah and Lu 2019, p. 166).

Even after Kwame Nkrumah was deposed, the plight of the local entrepreneurs did not drastically improve as the various military juntas that emerged sought to restrain the growth of the entrepreneurs due to suspicions that a powerful business class could undermine their power (Amankwah-Amoah and Lu, 2019).

The foregoing suggests that unlike Thailand, Ghana's entrepreneurial base is not deep. According to Sutton and Kpentey (2012), the agro-processing industry comprises of a few large international firms such as Nestle and medium scale firms. Majority of agro-processing activities however occurs in the informal sector where limited value addition is undertaken (Sutton and Kpentey, 2012). A review of the analysis carried out by Sutton and Kpentey (2012)

on the major agro-processing firms in Ghana, shows that most of the medium scale ones have foreign owners and they mostly produce for the local and regional market.

***Tuna Processing Industry***

Ghana's first tuna cannery, Pioneer Food Cannery, was established in 1972 through a partnership between Star Kist, an American tuna company and Mankoadze Fisheries, a local fishing and processing company (AllAfrica, 2004; Campling, 2012). Later, it came under Heinz's control after it (Heinz) purchased Star Kist (Campling, 2012).

The ownership of PFC changed to MW Brands after Heinz sold its European tuna arm to the company (Campling, 2012). In 2010, Thai Union acquired MW Brands, granting it control over PFC (Campling, 2012; Pananond, 2013; Thai Union, 2020). It is Ghana's dominant tuna cannery, producing about 200 metric tons of tuna per day (Drury O'Neill, 2013).

Other tuna canneries that have emerged since 1972 include the Ghana Agro-food Company which was established in 1994 by the Ghanaian government and the Swiss company Industrie-Bau Nord Ag, which owned 75 percent of the shares (Boateng, 2003). The company had a fairly diversified range of operations including fish, cassava and wheat processing and animal feed production (Boateng, 2003. p. 3). By 2007, the company was planning to close down its tuna activities due to rising costs and challenges with raw material supply (Myjoyonline, 2007).

Another tuna cannery, Myroc Company Limited, which was wholly Ghanaian owned, was established in 2002, producing private label for EU retailers (Drury O'Neill, 2013). By the time of my fieldwork exercise, the company had ceased operations. The company had been in financial distress, receiving a government bailout of $16 million in 2013, which it had struggled to pay back (Ghanaweb, 2017).

Currently, Cosmo Seafoods is the only tuna cannery in operation apart from PFC. The company has the capacity to produce seventy metric tons a day (Seaman, 2018). It is a joint venture of Silla, FCF Fisheries and local entrepreneurs and was established in 2011 (Seaman, 2018). Officials of the company informed me during my fieldwork that they currently produced

private label for European retailers whilst they supplied their own tuna brand to the local market.

### 6.3 Conclusion

In this chapter, I have briefly looked at the tuna industries of Thailand and Ghana within the context of the broader fishery and agro-processing sectors of both countries. I have demonstrated the relative strength of Thailand's fisheries and agro-processing industries including the tuna sector. In comparison, my analysis indicates that Ghana's fisheries and agro-processing industries in general and its tuna industry in particular are weak.

In Chapter 7, I investigate how the tuna processing firms in Ghana and Thailand have acquired the necessary skills to undergo upgrading in GVCs. Chapter 8 examines linkage formation from the tuna industries of Ghana and Thailand to the rest of the economy.

# Chapter Seven

## Upgrading in the Tuna GVC

### 7.0 Introduction

In this chapter, I discuss the results of my empirical study relating to how the Ghanaian and Thai tuna firms develop their technological capabilities and upgrade in their respective GVCs. The analysis undertaken here directly answers my second research question on how tuna firms in GVCs upgrade. This chapter also determines whether the GVC acts as the primary (or even sole) knowledge-transfer agent for firms in developing countries as is suggested within mainstream circles. I use the sectoral innovation system, the technological capability and the GVC frameworks for this analysis.

I first establish the main agents that constitute the sectoral innovation systems of tuna firms in Ghana and Thailand by relying on a combination of secondary data sources (particularly for Thai firms) and findings from my empirical study in Ghana.[40] Using Lall's (1992) taxonomy of technological capabilities, I then construct a simple matrix of specific activities undertaken by the tuna firms and the technological capabilities required to perform them. I follow that with a discussion that links each activity in the matrix (and its corresponding technological capability) with agents in the sectoral innovation system responsible for providing the knowledge required to perform it. I also include tuna fishing firms in Ghana in my analysis even though they enter GVCs at lower levels, supplying domestic canneries in Ghana.

The second leg of my analysis is to show how the acquisition of technological capabilities influences upgrading outcomes in the chain. By so doing, I can assess the depth of the technological capabilities of the firms, which in turn throws light on the quality of the sectoral innovation systems of Ghana and Thailand.

To complete my analysis on upgrading, I discuss the issues of income distribution and social upgrading in the tuna firms. This provides a fuller picture of whether integration into tuna GVCs automatically benefits developing countries.

[40] Some of the secondary sources used in determining the agents in Thailand's innovation system include Intarakumnerd et al (2015) and the websites of the tuna firms. The agents are presented in Table 13.

The rest of the chapter is structured as follows: Section 7.1 identifies the participants in the sectoral innovation systems of tuna firms in Ghana and Thailand. Section 7.2 considers the development of the technological capabilities of the firms. I first construct a matrix of technological capabilities and some associated activities of the tuna firm based on Lall (1992). Next, I discuss how the different agents in the innovation systems serve as sources of knowledge for the performance of activities at the firm. Although I do not extensively use Kim's (1998) learning framework as this would exceed the scope of my work, I make reference to it at various points of my analysis.

Section 7.3 examines the upgrading of tuna firms in Ghana and Thailand. Three main types are investigated, namely product, process and functional upgrading. Intersectoral upgrading is treated in Chapter 8 under linkages. I compare the depth of the upgrading outcomes amongst firms in Ghana and Thailand to demonstrate the relative strengths of their sectoral innovation systems and the underlying learning mechanisms that occur.

Section 7.4 unpacks income distribution and social upgrading in Ghanaian and Thai tuna firms. By examining their share of the value generated in their respective chains, I can comment on whether GVC participation has been fully beneficial and on how they can increase their income share. An analysis on social upgrading is conducted on the Ghanaian tuna fishing firms, where I examine the vulnerable workers in the chain; particularly those who may become worse off even as the firm upgrades.

Section 7.5 presents my conclusions.

### 7.1 The Sectoral Innovation Systems of Tuna Firms

Table 12 below shows the main agents that constitute the sectoral innovation system of tuna firms in Ghana and Thailand. They have been grouped under major categories comprising state agencies (including regulatory agencies), the firm in question, other firms such as suppliers and competitors, multilateral institutions, the GVC (buyer) and local buyers.

Table 12 The Sectoral Innovation System of Tuna Production and Processing in Ghana and Thailand

| Type of firm | Category | Some examples |
|---|---|---|
| Tuna fishing firms (Ghana) | State (regulatory) agencies | Fisheries Commission, Registrar General's Department, Ghana Investment Promotion Authority (GIPC), Ghana Revenue Authority, Ghana Standards Authority |
| | Multilateral Agencies & NGOs | ICCAT, EU |
| | Expatriate workers/investors at the firm | Captains, engineers, directors |
| | Own firm | Learning-by-doing |
| | Other firms | Competitors |
| | GVC | Buyers (local canneries) |
| | Business association | Ghana Tuna Association |
| Tuna processing firms (Ghana) | State (regulatory) agencies | Fisheries Commission, Registrar General's Department, Ghana Investment Promotion Authority (GIPC), Ghana Revenue Authority, Ghana Standards Authority |
| | Expatriate workers/investors at the firm | Owners, senior management, technical roles |
| | Own firm | Learning-by-doing, research |
| | Other firms | Foreign machinery suppliers, local distribution companies |
| | GVC | Foreign buyers |
| | Domestic market | Local buyers |
| Tuna processing firms (Thailand) | State (regulatory) agencies | Fisheries Department, National Food Institute, Thai Food and Drug Administration |
| | Expatriate workers/investors at the firm | Owners, workers, consultants |
| | Own firm | Entrepreneur's knowledge, learning-by-doing, research |
| | Other firms | Suppliers, competitors, local & foreign distribution companies, large firms, financial institutions, |
| | GVC | Buyers |
| | Business association | Thai Food Processors Association, Thai Tuna Industry Association |
| | Domestic market | Local buyers |
| | Universities | Mahidol University, Kasetsart University |

Source: Author based on empirical study. See footnote 40 for sources for Thailand.

The state agencies range from those set up to specifically deal with issues related to the food (or seafood) industry to those whose activities cover the registration of companies. The state agencies involved in setting policies affecting trade, industry and fisheries can also be included. Clearly, the list of agents set out in Table 12 is not exhaustive and putting all the different state agencies in one category for instance may be simplistic. However, the point I want to make is that the state is an important player in the innovation system of firms. Some of the ways specific agencies influence the knowledge the firms gain are, however, discussed in this chapter.

I identify the expatriate workers or investors (owners) as a distinct category in the table. This is because in most cases, these individuals come to the firm with knowledge developed from an external innovation system (for instance, the innovation system of firms in their home countries) which must then be distinguished from the local innovation system of the tuna firm that this study discusses. I also list the firm itself as an agent because of the methods it adopts to produce its own knowledge. This includes the knowledge workers gain through learning-by-doing (see Chapter 2) and research activities by the firm. I add the knowledge the local entrepreneur possesses when setting up and running the firm to this category even though such knowledge itself may come from various sources.

Another category that requires further explanation is “other firms”. This is a broad category that encompasses the firms that the tuna firm in question interacts with excluding its buyers, which is set as a separate category. The “other firms” category includes rival tuna firms in the country, usually operating in the same cluster, local and international suppliers of raw materials and machinery (suppliers for short) and local and international distribution companies. This category also includes financial institutions and any other firm that plays a supporting role in the activities of the tuna firm.

The sectoral innovation system of the tuna fishing companies in Ghana is relatively wide, in terms of number of agents, as it contains multiple fishing companies that form a cluster, the business association, the canneries and state and multilateral agencies. With regards to the sectoral innovation system of the tuna processing firms in Ghana and Thailand, the latter is both quantitatively and qualitatively richer than the former. This is because the Thai sectoral innovation system, from my observations, has a greater number of agents that transfer knowledge comprising of multiple tuna processors including two large firms, the GVC (foreign buyers), state agencies, machine and food packaging suppliers, other agro-processing

industries, universities, financial systems and several business associations including those specific to tuna, and the suppliers. The sectoral innovation system for the Ghanaian tuna processors is smaller as it contains just two canneries. Other significant agents are the state agencies and the GVC (foreign buyers). The Ghanaian tuna processors do not have many machine or food packaging suppliers operating in the sectoral innovation system. In addition, I do not find any extensive link between the firms and local universities, nor do I observe a strong role played by the local financial systems in the tuna industry. I also do not identify any strong business association that is exclusive to the tuna processors.

## 7.2 The Development of the Technological Capabilities of Tuna Firms

### a. Activity – technological capability matrix for tuna firms

#### i. Tuna fishing

Table 13 shows the list of activities for the tuna fishing firm that are associated with each capability.

Table 13 Tuna Fishing Technological Capability - Associated Activity Matrix

| Capability | Activity |
|---|---|
| Investment | 1. Meeting all regulatory requirements |
| | 2. Raising finances to make capital investments |
| | 3. Identifying and accessing technology |
| | 4. Identifying staffing needs |
| Production | 1. Tuna fishing activity including operation of vessels and extraction, handling and storage of tuna. |
| | 2. Meeting all food safety and fish conservation measures |
| Linkage | 1. Sale of fish to buyers |

Source: Author, based on Lall (1992)

Under investment capabilities, my objective is to identify how the skills required for the successful establishment or acquisition of a tuna fishing firm are obtained. These skills include the ability to meet all the regulatory provisions including eligibility requirements for the necessary business licenses. Also important is an assessment of how entrepreneurs can identify and raise financial resources to undertake capital investments for the new firm. Related to this

is how the firm ascertains knowledge on which technology to utilise in production. The firm must also determine the type of workers it needs and how (and/or where) they can be recruited.

Since the production capabilities mainly cover the core production operations of the firm, my interest is in examining the different ways the tuna workers, particularly the fishing crew, gain the knowledge required for their operations. The firm's production activities also include the administrative component which involves the general running of the firm, ensuring adherence to regulatory protocols and making managerial decisions that affect production.

Although linkage capabilities broadly relate to interactions between the firm and external actors in Lall's (1992) study, I limit my enquiry to how the firm connects to its buyers, which for the Ghanaian tuna fishing firms, are the canneries. I do not examine market capabilities for the fishing firms in Ghana since they usually do not export their products.

### ii. Tuna processing

Table 14 below contains the activities associated with technological capabilities in tuna processing firms.

Table 14 Tuna Processing Technological Capability - Associated Activity Matrix

| Capability | Activity |
|---|---|
| Investment | 1. Meeting all regulatory requirements |
| | 2. Raising finances to make capital investments |
| | 3. Identifying and accessing technology |
| | 4. Identifying staffing needs |
| Production | 1. Tuna canning activities i.e. factory activities |
| | 2. Meeting all certification and food standards provisions |
| Linkage | 1. Connect with component suppliers |
| | 2. Connect with buyers |
| Market | 1. Entry into foreign markets. That is marketing, distribution and sales of the firm's own brands |

Source: Author, based on Lall (1992)

The activities that are connected to investment capabilities are the same as those mentioned for the tuna fishing firms and will not be restated here. The production capabilities required for

tuna processing go beyond those that occur on the factory floor to include associated services like quality control, health and safety, laboratory activities and others. I also include the general management of the firm in this category, particularly the aspects that directly affect production. Finally, I incorporate all activities that relate to meeting food standards and obtaining the necessary certifications in this category.

For the linkage capabilities, my objective is to highlight how the tuna processors connect with their lead firms. Based on Lall (1991), the activities under market capabilities involve those that relate to the tuna processor successfully entering developed markets with its own brand and this includes marketing, distribution, sales and even after-sales service. The difference between the activities associated with linkage and market capabilities in this study is that whilst the former relates to supplying buyers in a GVC, the latter contends with entering mature markets with own brands.

Having developed this matrix, I can now examine it closely vis-à-vis the agents in the sectoral innovation system that transfer knowledge to enable the firm build up its capabilities to conduct activities at the firm.

**b. Promotion of technological capabilities**

**i. Ghanaian tuna fishing firms**

***Investment Capabilities***

Tuna fishing firms fall under the general regulatory regime covering companies in Ghana. The pre-conditions for setting up a company are determined and supervised by several agencies including the Registrar General, Ghana Investment Promotion Centre (GIPC) and the tax authorities. In addition, there are industry-specific conditions which tuna fishing firms must meet before starting operations. The relevant provisions are contained in regulations and often published on websites or in documents such as brochures by the relevant agencies to guide potential entrepreneurs. The Fisheries Act 625 (2002) is an example of a legal code with specific provisions for tuna producers. The World Bank's 2020 Doing Business Report for Ghana provides a comprehensive overview of the legal framework for commencing a business in Ghana. (World Bank, 2020a). I find that the instructions are clear for the tuna fishing firms

to follow. The information contained in the laws, documents and websites are explicit. Therefore, based on Kim's (1998) learning framework, they can be transformed into tacit knowledge in an internalisation process for use by the entrepreneurs.

With reference to the issue of mobilising financial capital for investments, a representative of one the tuna fishing firms, TF2, indicated in an interview, that the foreign partners of the fishing companies often possessed the knowledge/skill. The representative argued that apart from the initial stated capital that both partners contributed to (which depended on their individual stakes), the foreign partner typically secured funds, usually from his home country, for capital investments in the firm. An official from the Ghana Tuna Association, TA1, corroborated this assertion by indicating that

> *"it would have been a good thing to have wholly Ghanaian companies but the problem is the lack of capital. It is not easy acquiring a vessel, so only a few local partners might have that sort of equity to become shareholders"*
>
> (TA1)

According to a financial consultant I interviewed, R6, Ghana's financial sector is relatively underdeveloped. For the fishing companies, the banks were the most viable source of raising finance (TF2). However, the banks were often reluctant to support the tuna firms because the "*risk element is very high*" (TA1). Local investors were mostly disinterested in the tuna industry due to the common connotation of fishing as a low-income venture (TF2).

Potential entrants into Ghana's tuna fishing industry have multiple sources to rely on for knowledge on their technology and staffing needs. First, according to an official of Ghana's Fisheries Commission, TA2, domestic and multilateral regulatory agencies like the Fisheries Commission of Ghana and ICCAT, provide extensive explicit information on permissible technologies and practices. Second, knowledge diffusion within the tuna cluster can potentially assist new entrants to identify what type of technology and human resources are required for their operations. Third, it is likely that the foreign partners, who are mainly South Koreans with experience in tuna activities (Drury O'Neill, 2013; TA1), possess knowledge on the technological and human resource requirements of the firm given their experience and connections in the tuna fishing industry. Finally, some Ghanaians have built up their experiences from working for tuna companies over a long period, enabling them to acquire

knowledge regarding the technological and human resource needs of tuna firms, which they can use when starting their own firm (TA1). Most of the sources just mentioned above, namely the tuna cluster, the foreign partners and the local workers, will transmit tacit knowledge, which, as suggested by Kim (1998), will add up to the existing stock of tacit knowledge of entrepreneurs in a socialisation process. With specific regards to where they bought their vessels, one tuna fishing firm representative, TF2, told me that they normally procured the second-hand vessels of Japanese companies, which are due for replacement.[41]

***Production Capabilities***

The main source of production knowledge (skilled work) aboard the fishing vessels is the foreign workers (Drury O'Neill, 2013; TA1; TF2; TF4). A tuna fishing crew typically consists of a captain, chief officer (and a 2nd officer), chief engineer (and 2nd engineer), fishermen, cooks and artisans such as metal workers and electricians (Drury O'Neill, 2013; TA1; TF1; TF2; TF3, TF4).[42] The captains, chief officers and the chief engineers are usually foreign, mainly of South Korean and Chinese descent, (Drury O'Neill, 2013; TF3), whilst some of the engineers on some boats are Ghanaian (Drury O'Neill, 2013; TF1; TF2). According to Drury O'Neill (2013), the Ghanaian firms often depend on recruitment agents based in South Korea and China, to hire the captains and other crew members on their behalf. In other instances, the expatriate workers in Ghana recommend close associates in their countries for employment (Drury O'Neill, 2013). As to why South Koreas dominate Ghana's tuna fishing sector, an interviewee explained as follows:

> *"Aside the capital [they bring], they have the expertise. In Korea, they have about 6 tuna fishing universities. We do not have one in Ghana. So the policy is that once they come, Ghanaians learn from them to take over eventually but as at now, we have not been able to do that yet"* (TA1)

TA1 also suggested that since the foreign part-owners of the fishing companies were South Korean, and they were instrumental in procuring the vessels, they hired their compatriots to

[41] Panofi, the most powerful tuna fishing company in the country has the largest fleet with relatively modern vessels (in terms of age) (see Chapter 6). Since its owners includes a tuna fishing company with a long-distance fleet, it suggests that the foreign investor has the knowledge on what technology to use and how to get them.
[42] Drury O'Neill (2013) suggested that the fishermen were the ones that performed carpentry and metal work. TF1, TF3 and TF4 are representatives of fishing companies I interviewed.

manage their vessels "*because if you buy your vessel, you would not want to entrust it to [just] anybody*" (TA1).

There has been a slowdown in the recruitment of foreign crew workers, dropping from twelve workers per vessel to about four (TA1). This has been precipitated by the huge wage bill associated with hiring a high number of expatriates at a time when the profitability of the companies is falling (TA1). Unfortunately, local workers have not filled the space created by the drop in the recruitment of the expatriate workers (TA1). This is owing to a shortage in local workers to perform the highly skilled technical roles on the vessel (TF1; TF2; TF3; TF4). This implies that the operation of the foreign workers on the vessels has not stimulated significant knowledge transfer to local workers.

Ghana has a maritime university, the Regional Maritime University (RMU), and according to an official of the school I interviewed, NT6, it has the capabilities to train workers to serve as captains, engineers and officers on the fishing vessels. When asked where their students normally ended up, the interviewer said:

> *"[About half] are in the foreign-going vessels, container vessels, cruise ships, cargo vessels and then the other [half are] in the oil and gas [industry]"* (NT6)

When asked further as to why their students choose this path and avoided fishing vessels, the respondent explained as follows:

> *"Even for the big fishing vessels that do foreign-going, their remuneration is not as equal as those on the cargo vessels or even offshore vessels. Again I will say it is down to availability of opportunities because usually we have companies coming to request our students. Some are even picking the graduates who are done with school and others are [funding] the training of students through school but you can barely identify companies from the fishing industry coming for people. As for the skills, there is no question but the individual would perhaps think about money or career rise and if you see, most of the senior officers in the fishing industry are very old people.*

*They (the students) will go to the cargo vessels and later when they think they are satisfied, come to the fishing vessels "* (NT6)

According to NT6, this situation was influencing the school's curriculum as greater emphasis was being placed on the industries with stronger demand for their students such as oil and gas. My interviews with the tuna fishing firms suggested that the problem, from their perspective, was not a mere lack of interest from the fishing companies to hire the students from RMU. As one respondent put it:

*"If you train and they come out, in no time, they go away in search of greener pastures"* (TA1)

Therefore, it seems that the negative experiences of the firms in the past where, after offering practical experience to the students, they left for more lucrative jobs on merchant ships, had forced the tuna companies to depend on foreign workers rather than take a risk with local ones (TF2). Indeed, according to TF4, a representative of a tuna fishing company, they lost some of their crew members to "*merchant ships or oil rigs*" (TF4).

TF2 indicated that the main requirements for the cooks, carpenters and electricians to be employed were their possession of basic knowledge and their fitness. Likewise, the fishermen were employed for their physique and their "*ability to fish with hooks or nets*" (TF4).

In terms of administrative roles, both local and foreign workers are engaged by the tuna fishing companies (TA1; TF1; TF2; TF3; TF4). According to TF2, the Ghanaians based in the offices of the fishing companies had significant expertise in the tuna activities. This claim was corroborated by TF4, who indicated that Ghanaians occupied high level senior positions such as operations manager, procurement manager and accountant in the firm. TF3 provided a full breakdown of the senior management at the firm, and this is presented in Table 15 below.

Table 15 Nationalities of Management Staff of a Tuna Fishing Firm (2018)

| Position | Nationality |
|---|---|
| Managing Director | Korean |
| CEO | Korean |
| Director (Operations) | Korean |

| | |
|---|---|
| Director (Admin) | Ghanaian |
| Director (Technical) | Ghanaian |
| Head of Administration/Finance | Ghanaian |

Source: Author based on data supplied by TF3.

It can be argued that the expertise of the Ghanaians was built up by their close working relationship with the foreign senior executives of the firm. The Ghanaian directors were intimately involved in management decisions (TA1; TF2). According to TA1, who also worked in a tuna fishing company,

> *"Anything that comes, the Ghanaian and foreigner partners decide. He (foreign partner) cannot do anything without his (Ghanaian partner) knowledge. They are joint signatories to the account. One cannot sign anything without the other's knowledge. When one is travelling, he leaves a message with the bank but as soon as he returns, they revert to current procedures"* (TA1)

This close engagement promotes the exchange of knowledge between the local and foreign directors, deepening their production capabilities. As noted earlier, some of the Ghanaian workers enhance their capabilities, in this case relative to production, from their previous work with other tuna fishing firms (TA1). Additionally, knowledge diffusion within the cluster can also induce the development of the production capabilities of the Ghanaians.

The canneries also transfer some knowledge to the fishing firms by way of their purchase decisions, which is influenced by issues such as the quality of the fish according to an official from a cannery I interviewed, TC1. However, from my observations, the governance structure covering the interactions between the canneries and the tuna fishing firms can be described as a market one, which implies that their interactions are relatively loose and knowledge transfer weak.[43] There was no formal training programme organised by the canneries for the fishing firms to boost their production capabilities (TC1).

[43] Since there are many tuna fishing firms relying on a small number of canneries, the governance structure can also be identified as being captive.

Some state agencies like the Fisheries Commission are important sources of knowledge for the enhancement of the production capabilities of the workers in the fishing firms. One representative of a fishing firm told me that the firm did not conduct any research but depended on the output of Ghana's Fisheries Commission (TF4). The Fisheries Commission has a Fisheries Scientific Survey Division, whose mandate is to conduct research, in order to allow for the enactment of appropriate policies towards the sustainability of the country's fishery resources (Ministry of Fisheries and Aquaculture Development, 2020). The areas its research covers include "*fishing gears"* and "*fish stocks and statistics*" (Ministry of Fisheries and Aquaculture Development, 2020). Based on Kim (1998), the knowledge from the research, which will be explicit, will then be internalised by workers in the firm and turned into tacit knowledge.

Another important agency promoting the production capabilities of firms is the Ghana Standards Authority. It is the competent authority of the EU in Ghana, whose responsibility is to ensure that tuna products exported from Ghana to the EU meet the appropriate standards (Drury O'Neill, 2013; Ghana Standards Authority, 2012). Officials from the authority informed me that they conduct regular inspections of the fishing companies to ensure they met all food and safety regulations. They also indicated that they were regularly trained by the EU and updated their protocols where necessary which was then passed on to firms during the operationalisation of their protocols. The knowledge they transferred would be either explicit, such as those contained in official documents or tacit, like the ones emanating from verbal interactions between officials of the authority and the firms. Following Kim (1998), the explicit knowledge would be internalised by the firm whilst the tacit knowledge is socialised.

The Ghana Tuna Association (GTA), which originally comprised only the fishing firms, has now incorporated the canneries (TA1). The respondent from the association I engaged with indicated that the association served as the formal body that represented the firms in addressing various issues with the government and multilateral agencies like ICCAT. At the time of my fieldwork, the EU had set some new regulations which required the association to take responsibility to ensure that all the tuna fishing firms were compliant with these new provisions (TA1). Since the infractions of just one firm can result in a ban on tuna fishing (and hence processing) for all firms, the GTA has become an important vehicle to raise the capacity of all the firms to ensure adherence to all the regulations (TA1).

***Linkage Capabilities***

I argue that the way Ghana's tuna industry is structured, where tuna fishing firms and canneries are inter-dependent, fosters linkages between the tuna fishing companies and their buyers. This diminishes the requirement for deep linkage capabilities in order to establish connections to buyers. All but one of the tuna fishing firms I interviewed indicated that the local canneries were their main buyers. In my interactions with the representative of the fishing firm with no business relations with the canneries, the respondent indicated that the firm supplied about 60 percent of its products to the local market for direct consumption and exported the rest to the EU and the Middle East. The respondent further speculated that the company's frayed relationships with the canneries were due to tensions that developed over previous attempts by the fishing firm to expand into tuna processing to compete with the existing canneries.

In general, the fishing firms are not obliged to supply to local canneries even though that was a cheaper option, compared to exporting to international markets, due to the logistics involved (TA1; TF2; TF4). When asked why the tuna fishing companies were locked into supplying the domestic canneries, the representative of the GTA said:

> *"The fish has an international price and every month it changes. So you have an idea of what the price is. If you do not give it to the (local) canneries, where are you going to sell it, because you can only supply just about 30 percent to the local market? You cannot have direct export – it is cumbersome and expensive. So we think we should expand the market. When we expand the market and our fish comes, we supply to those we want: simple demand and supply. The market now is restricted and it is the EU that has a lion's share with the rest going to the local market"* (TA1)

In other words, since the local canneries paid the world market prices for the fish, price was not a significant incentive for the fishing companies to export their products (TA1). In a situation where the canneries were unable to purchase all the tuna supplies of the fishing companies, the fish were exported to canneries in Abidjan (TA1).

According to TF2, the strict provisions of the EU and ICCAT were burdensome and costly. Increasing the quantity supplied for direct consumption in the domestic market was not feasible

because the fishing firms needed foreign exchange, which they currently generated from their sales to the canneries, to import fuel and spare parts (TA1; TF4).[44] Besides, the local market is just too small (TF4).

Despite the relatively large number of tuna fishing firms in operation, Asiedu et al. (2015) argues that their total output cannot sufficiently meet the raw material requirements of the canneries to enable them (canneries) operate at 100 percent capacity. Whilst this may suggest that the fishing companies have a strong demand for their fish, TC1, a representative of a cannery, implied that it was not automatic that they would buy from any fishing firm. TC1 argued that the cannery had supplier agreements with the fishing companies and only bought from those that met conditions such as "*quality purchasing, food safety and legality assurance*" (TC1). TC1 further added that purchase decisions of tuna fish were also influenced by the relationship the cannery had with the vendor.

It can be argued that the prerequisites the canneries set for the fishing companies before buying their fish, serve as some form of knowledge transfer, which enhances their linkage capabilities. Also, one can argue that knowledge diffusion with the cluster boosts the capacity of the fishing firms to negotiate supplier agreements with the canneries.

### ii. Tuna Processing Firms

### a. Thailand

***Investment Capabilities***

In Thailand, several state agencies provide explicit information on the steps for establishing new companies. Some of these measures are summarised in the World Bank's 2020 Doing Business Report for Thailand (World Bank, 2020b) and will not be elaborated here.

I argue that some of the owners of the tuna processors possess knowledge in raising finance for capital investments from their previous business ventures. This assertion is based on the accounts of Phongpaichit and Baker (2000) and Simon (1996), who suggest that many Thai

[44] By operating in the export processing zone, the tuna firms were mandated by law to sell 30 percent of their products in the local market (Drury O'Neill, 2013; TA1; TC1; TF1; TF2; TF4). They usually supplied the small sized fish to the domestic market (TF2).

businesses adopt a diversification strategy where they moved into new business areas. Some of the early tuna companies were therefore subsidiaries of major groups or families that already had a significant footprint in other Thai industries like the case of the largest Thai tuna processor in the 1980s, Unicord, which was owned by the Thai Konuntakjet family (Seafood International (1989) as cited in Corey (1990, p. 16)), a major player in the agribusiness industry (Corey, 1990). Pataya Food Industries was formed by traders who took advantage of the state's incentive structure to go into the manufacturing of tuna (Pataya Foods, 2020). A relatively modern tuna firm, Siam International Food Company, was created in 2005 by a group of commercial fishermen who responded to the incentives of the Board of Investments (BOI) to go into tuna manufacturing (Siam International, 2020).

Indeed, many of the early tuna canneries were former fruit and vegetable processing companies (Hamilton et al., 2011; Kuldilok, 2009). This was possible since the processing facilities of some food companies were designed in a way that enabled the firms to easily switch between products in response to changes in raw material supply (Corey, 1990).

I also argue that Thailand's relatively well-developed financial sector supports the investment capabilities of the firm, particularly in raising finance. This makes financial institutions critical knowledge-transfer agents in the sectoral innovation system of the tuna processors. The Thai stock market for instance, has been an important avenue for some major tuna canneries to raise capital. Thai Union, the world's largest tuna processor, listed on the Thai stock exchange in 1994, which allowed the injection of fresh capital into the firm (Pananond, 2013; Thai Union, 2020). The company made some domestic purchases, including a majority stake in the main canned tuna and cat food manufacturer in the country at the time, Thai Ruamsin Pattana (Pananond, 2013). These investments allowed the firm to hone its investment capabilities such that, in 1997, it was able to partner with international investors to make its first major international investment in the acquisition of Van Camp Seafoods, which owned the third biggest tuna brand in the USA (Fundinguniverse.com, 2020; Pananond, 2013; Thai Union, 2019a, 2020). The knowledge that the financial institutions share may be explicit, such as information contained in brochures and on their websites, or tacit, such as the information shared in conversations between workers of the financial companies and those in the tuna firms.

Similarly, the past knowledge of the owners, garnered from other industries, enables them to identify and secure the technology and workers required for the firm. Given the large number

of tuna canneries operating within in a cluster (see Table 11), knowledge diffusion within the cluster can assist new entrants with knowledge on meeting the technological and staffing needs of the firm. It is even possible that knowledge of new technologies can be transferred directly from the machine suppliers (processing and packaging) since many are based in Thailand, and are members of the Thai Tuna Industry Association (TTIA) (Thai Tuna Industry Association, 2020c). These machine suppliers include multinational firms such as the American technology provider, John Bean Technologies Corporation, which has multiple production sites spread globally serving key markets and has set up a local office for sales and support in Thailand (John Bean Technologies, 2020).

Finally, for the tuna firms that are joint ventures, such as the first one created in the industry (Corey, 1990; Crough, 1987), they can depend on their international owners who may have experience in tuna processing in their home country for knowledge regarding its technology and staffing needs.

***Production Capabilities***

Since many Thai entrepreneurs/companies, as noted earlier, have built up their experiences over time from operating in different industries, they already possess some production knowledge when moving into tuna processing activities. Corey (1990), Hamilton et al., (2011) and Kuldilok's (2009) suggestion that some agro-processing firms diversified into tuna manufacturing affirms this assertion.

Furthermore, new tuna processors have access to production knowledge that disseminates within the cluster from rival tuna firms, fruit and vegetable canneries and suppliers. The mobility of workers within the cluster also promotes the cross-application of knowledge among the tuna firms. For instance, the tuna processor, MMP Trading, mentions on its website that it hired an American expert who had been with another Thai firm for 13 years (MMP Trading, 2020b). Poaching this professional allowed the firm to benefit from his expertise in food safety in order to pass US food safety checks (MMP Trading, 2020b).

It's worth noting that the Thai tuna cluster contains the world's leading tuna producers, Thai Union and Sea Value (Hamilton et al., 2011; The Asia Foundation and ILO, 2015). These large

firms, with their financial and technical resources, can potentially conduct their own R&D, thereby generating knowledge to manufacture new products and improve their production processes. Indeed, Thai Union has started its Global Innovation Centre in Bangkok to "*engage in research related to fundamental studies of our raw materials, new processing technology, and utili[s]ation of rest-raw materials to create added value*" (Thai Union, 2019a. p. 90). In addition, the company works with a number of Thai universities such as Mahidol University and Kasetsart University to undertake research (Thai Union, 2019a). The company also runs a research programme, supported by Thailand's BOI, which targets "*fundamental and applied research that resonates through the value chain*" (Thai Union, 2019a. pp. 90-91). As the knowledge generated from these ventures diffuses within the cluster, the smaller tuna firms gain critical production knowledge.

The large firms may sub-contract or acquire smaller tuna firms to undertake tuna manufacturing. Thai Union, for instance, acquired another local cannery, Songkhla Company, which suggests that knowledge generated from its R&D will be transmitted directly to its subsidiary (Thai Union, 2019a).

The Thai Tuna Industry Association (TTIA), comprising of tuna processors, suppliers and trading companies, provides a platform for the industry players to address problems plaguing it (Thai Tuna Industry Association, 2020b). Until the creation of the TTIA, the tuna firms were part of the Thai Food Processors Association (TFPA) which was formed in the 1970s, when Thailand's agro-processing sector was taking off (Thai Food Processors Association, 2020a). With the backing of the TFPA, the various agro-processing firms were able to deepen their knowledge on producing for the developed markets (Thai Food Processors Association, 2020a). Currently, the TTIA periodically organises seminars and conferences on various issues and is therefore an important source of knowledge to the tuna firms (Thai Tuna Industry Association, 2020a).

The Thai tuna manufacturers may directly receive knowledge from their suppliers, some of which state on their website that they have the capacity to conduct R&D to develop solutions and new products. For example, John Beans Technologies state on their website that:

> *"[W]e also support our customers in their development of new food products and processes as well as the refinement and testing of their*

*current applications through ten technical cent[re]s"* (John Bean Technologies, 2020, p. 5).

The domestic Thai market (and by extension local buyers) also serves as an important source of knowledge for the tuna firms through the feedback of customers to new products. In addition, according to Intarakumnerd et al. (2015) and Murray (2007), the sophisticated tastes of Thai consumers stimulate the development of new products by seafood companies. The authors also suggest that as Thai consumers have become richer, they are now demanding higher quality food products which affects the operations of the firm. These conditions potentially sharpen the capabilities of the tuna processors to produce to the standards of mature tuna markets. In addition, the local market can serve as a "testing ground" for the tuna processors to deepen their knowledge through learning by doing, so as to enter more lucrative tuna markets. It helps that Thai Union's SEALECT tuna brand is supplied exclusively to the local and regional market and shares the same quality as its international brands (Thai Union, 2020) since that serves as an important benchmark for the products of the smaller tuna firms.

So far, I have only discussed the domestic sources or agents for the generation and/or transfer of production knowledge to the Thai tuna processors. However, evidence shows that the insertion of Thai tuna firms in GVCs has led to the development of some aspects of their production capabilities. Those aspects mainly relate to the skills that propel the firms to enter the mature tuna markets. There are two main types of GVCs observed in the Thai industry: the relational chains and the modular ones. I argue that the relational chains were dominant during the early stages of the industry when tuna processors were in their nascent stages of development but as the industry has matured, most of the firms are involved in modular chains.

The story of Thai Union best summarises the influence of GVCs in the growth of the tuna industry in Thailand. Thai Union, in the early stages of its development, partnered with its Japanese buyers, the food company, Hagoromo, and distribution firm, Mitsubishi, to boost their knowledge in producing for the Japanese market (Thai Union, 2019a). The company, like several tuna firms in Thailand, also acquired skills from its interactions as a sub-contractor with American tuna companies (Encyclopedia, 2020). According to Corey (1990), this engagement between the Thai canneries and their American buyers led to an alignment of their "*methods and technology*" (p. 5 (chapter 5)). In addition, the author suggests that the Thai firms at the

time were adept in the manufacturing of small tuna species like skipjack and tongol. This implies that their capabilities had to be raised by their American buyers to enable them to manufacture large sized tuna fish for the North American market. Furthermore, since albacore was a delicacy in the American market (Corey, 1990), it can be argued that the American canneries assisted their Thai suppliers in its manufacture. The lead firms at this time were mainly tuna companies from the USA that had ceased manufacturing activities and outsourced them (Corey, 1990).

Applying Ernst and Kim's (2002) GPN approach (which incorporates Kim's (1998) learning framework) to demonstrate the knowledge transfer process in the tuna chains, it can be argued that the lead firms (that is, the American canneries) transferred explicit knowledge in the form of documents and formal training programmes. They could also transfer tacit knowledge through conversations and other informal communications between their technicians (lead firms) and their Thai tuna suppliers. The Thai suppliers would internalise the explicit knowledge coming into the firm and transform it to tacit knowledge for use. They would undergo a socialisation process to build up their stock of tacit knowledge with incoming tacit information. Where the tuna suppliers documented some of their knowledge on their websites, company manuals and even standard operating procedures, it would involve an externalisation process, where tacit knowledge coming from the lead firms was turned into explicit knowledge. Finally, there could also be a combination process where explicit knowledge transferred to the suppliers by their lead firms was integrated into their existing stock of explicit knowledge.

Today, newly established tuna firms are likely to be involved in modular chains, mainly producing for retailers. According to the information displayed on their websites, one can argue that most of the Thai tuna firms boast of superior capabilities, leading to the production of a wide range of products with differing levels of complexity. This diminishes the importance of lead firms establishing tight control over them. In any case, many of the Thai suppliers indicate on their website that they produce for foreign retailers. These kind of lead firms usually operate modular chains as there is limited transfer of production knowledge. These arguments are explored in Section 7.3.

What is worth noting at this point is that a tuna cannery that is established in Thailand today can quickly deepen its production capabilities to produce world class tuna products. This is because of the rich sectoral innovation system it operates in (and the knowledge transfer

mechanisms contained therein, which have been discussed so far) which implies the successful diffusion of knowledge. This reinforces Carlsson et al (2002)'s argument on the innovation system's purpose being to "*generate, diffuse and utili[s]e technology*" (p. 235). Crucially, the analysis has underscored the critical role of the domestic innovation system in ensuring that the knowledge gained by some firm in the GVC has benefitted the wider tuna industry.

***Linkage Capabilities***

I argue that the insertion of Thai firms into GVCs was spurred by prevailing demand and supply conditions. On one hand, the Thai government shifted its emphasis to promoting foreign investments using the BOI to offer attractive tax waivers or reductions (Crough, 1987; Hamilton et al., 2011). This coincided with American tuna companies pursuing suppliers in Asia as part of their cost-cutting measures (Corey, 1990; Hamilton et al., 2011). This perfect mix of demand and supply conditions promoted the links between suppliers and their lead firms. In addition, one expects some of the Thai tuna processors to possess pre-existing linkage capabilities and international networks, which have been developed from their previous undertakings in other industries. The knowledge on how to connect with foreign buyers including the negotiation of contracts may also be diffused within the cluster.

Some Thai tuna processors in recent times have pursued more aggressive schemes to connect with their international buyers. On the websites of several tuna firms, I noticed that potential buyers could establish direct contact with the firm. Others have partnered or established domestic or international marketing and trading companies to link to buyers. For instance, Pataya Food has created Altrade Finance SA to market its own brand, Nautilus (Pataya Foods, 2020). The company also co-established a marketing firm in China to link its brands to buyers (Pataya Foods, 2020). These strategies may be based on the knowledge that flows within the cluster as well as the firms' previous experience in other agro-processing sectors. Companies also attend international exhibitions and fairs where they meet buyers or their representatives directly allowing the transfer of knowledge. For instance, MMP tuna company highlights some of the international fairs they have participated in in countries like the USA, Russia and UAE (MMP Trading, 2020a).

***Market Capabilities***

In the developed markets, Thai tuna brands do not have a strong presence with their own brands (see Chapter 4) except those that are currently owned by Thai Union. It appears that most of the Thai firms do not have the vast resources required to enter a mature market, promote their brand and connect with distributors and retailers for sales. Therefore, I can infer that their market capabilities are underdeveloped.

Table 11 indicates that many of the smaller tuna processors focus on the Thai, Middle Eastern, Asian and African markets. The entry barriers to those markets as well as the local competition the Thai brands will face are likely to be lower. I posit that these low barriers to entry imply that the market capabilities required to enter those markets are not very steep. It can further be argued that the Thai firms gain knowledge on market entry, marketing, sales and distribution to these emerging markets from their experience in the local Thai market. This provides a platform for them to hone their skills. They may also obtain knowledge from trading agents based in the end markets who assist them to know the market.

**b. Ghana**

***Investment Capabilities***

I do not delve deeply into how the regulatory agencies in Ghana provide explicit knowledge to potential entrepreneurs seeking to establish tuna canneries since the analysis of this issue under the tuna fishing firms is equally applicable to the processors.

Whilst the previous experience of the Thai entrepreneurs in other industries has proven to be a vital source of knowledge for the enhancement of their investment capabilities in the tuna industry, this has not been the case for Ghanaian processors as there has not been a similar growth of the country's entrepreneurial base (see Chapter 6). As suggested earlier, I did not observe a strong cluster of many tuna firms and suppliers in Ghana and this situation undermines the potential for the cross transfer or diffusion of knowledge.

In the absence of a robust tuna cluster (and hence, a weak domestic sectoral innovation system), the Ghanaian tuna processing firms, PFC and Cosmos, will have to rely more on their own resources to generate knowledge to boost their capabilities. Since the two canneries have foreign ownership (see Chapter 6) and operate in GVCs, I can evaluate the extent to which GVCs alone influence the development of their technological capabilities.

Silla and FCF Fisheries, current part-owners of Cosmos (Seaman, 2018; TC1) and Star Kist, previous (the first) part-owner of PFC (Campling, 2012), are international conglomerates with experience in the tuna industry and who come from countries with relatively sophisticated financial sectors. As such, these owners were likely to possess the knowledge required for deepening the investment capabilities of the firm. This includes the issue of how to raise financial capital for investments.[45] However, since the tuna canneries in Ghana are only subsidiaries, they may be far removed from top level decisions taken at the headquarters by the parent firms which will inhibit the transfer of knowledge from their foreign owners to local workers with respect to raising finance for investments. In other words, whilst the firm possesses the knowledge (embodied in the foreign owners), the local Ghanaian workers in the firm themselves may not acquire it.

In terms of the identification and procurement of technology for use, the absence of a strong tuna cluster does not appear to inhibit the ability of the canneries to access the required technologies. According to a representative of a cannery I interviewed, the firm simply imports its equipment (TC1), implying that technology for tuna production can be obtained in arms-length transactions. In any case, the internet can potentially be a critical source of knowledge for the firms relative to the issue of technology. This observation is made by Fu et al. (2014), who indicate that some Ghana manufacturing firms depend on the internet for knowledge on various aspects of their operations. Their study is explored further in Chapter 9.

Furthermore, as has been suggested already, the owners of the two canneries in Ghana are able to influence the firms' identification and procurement of technology as well as their staffing needs. One can argue that since at the time of establishing PFC in 1972 (Campling, 2012), Ghana had no experience in tuna processing, Star Kist played a critical role in determining the

[45] Although both PFC and Cosmos are subsidiaries of international firms, I do not consider Cosmos' relationship with its owner as constituting a GVC because the owner does not serve as a buyer of the products unlike the case of PFC where the lead firm acts as the buyer of the tuna products of its subsidiary.

technological and human resource needs of the firm. Indeed, in my interactions with TC1, I was informed that South Korean and Filipino nationals occupied managerial and supervisory roles at Cosmos.

It must also be mentioned that due to the international mobility of labour, the tuna canneries can compensate for the inadequacy of the domestic sectoral innovation system by hiring foreign consultants who can provide knowledge to the firms to boost their investment capabilities.

Although the wholly indigenous tuna processor, Myroc, that was in operation, had collapsed by the time of my fieldwork, I was interested in how it gained its investment capabilities. Information available indicates that its founder formerly undertook chicken and beef processing (Arthur, 2010) and this previous experience or knowledge could be a critical source of knowledge, in the absence of a strong domestic sectoral innovation system, for the enhancement of the firm's investment capabilities.

***Production Capabilities***

For PFC, by virtue of it being a subsidiary of an international tuna manufacturer, it is highly dependent on its parent firm, Thai Union, for production knowledge. Thai Union operates multiple factories across many countries and spreads the production of its tuna brands over its different subsidiaries (Thai Union, 2019a). This strategy compels the company to ensure that the same tuna brand manufactured in Ghana is of the same quality as the one produced in Seychelles or in Europe (Thai Union, 2019a). This is in line with arguments made by Schmitz (2004, 2006) that lead firms in captive chains, are motivated to transfer knowledge to their suppliers to ensure that standards are not compromised.

Thai Union has developed several strategies in lieu of raising the capabilities of its subsidiaries to the required standard. Since it usually interacts with its suppliers under hierarchical governance structures (the firm is vertically integrated into many of its subsidiaries (Thai Union, 2019a)), it has greater control over the process of influencing the capabilities of its supplier. It is worth quoting the company extensively on how it maintains standards across its subsidiaries:

> *"Thai Union has over 20 production facilities in North America, Europe, Africa and Asia. Our factories fulfill all required technical and quality standards, and we also have kosher and halal certified factories to support specific groups of customers. In order to constantly improve the health and safety of our workers, all operations are regularly assessed according to specific evaluation criteria, and training and improvement needs are addressed. Best practice sharing and the establishment of a culture of continuous improvement ranks high on our agenda. A new position has been created within Thai Union to oversee operational excellence at the production facilities… In September 2018, the supply chain management team from across Thai Union's global network came together for our first global Operational Excellence Summit. The objective was to share best practices and align on common standard KPIs for all of Thai Union's production facilities. The summit was also intended to reinforce collaboration across Thai Union's global supply chain network, and deploy Operational Excellence standards and policies"* (Thai Union, 2019a, p. 14)

In addition to these strategies, since Thai Union also invests in R&D (Thai Union, 2019a), it is likely to share the results with its subsidiaries to operationalize the knowledge. For instance, through R&D, it has developed a new transparent packaging material as well as a fresh tuna product that is packed in a plastic cup (Thai Union, 2019a).

The foregoing supports the conventional argument that suppliers from developing countries can rely on their lead firms for the knowledge to enhance their capabilities to undertake upgrading. PFC is therefore expected to acquire the most advanced knowledge from Thai Union, which will raise its capabilities to high levels. In addition, this mechanism can mitigate the lack of a robust domestic sectoral innovation system of the Ghanaian tuna processors.

The problem, however, is that, in a hierarchical chain, the lead firm serves as a gatekeeper of the knowledge it produces. Thai Union therefore dictates what knowledge is shared with which subsidiary. According to Drury O'Neill (2013), as well as data provided to me by the Customs and Excise Preventive Service of Ghana, PFC mainly manufactures canned tuna. This implies that the knowledge that is shared with PFC by Thai Union is not deep compared to other

subsidiaries of the company that produce more innovative tuna products. As noted already in Chapter 3, Schmitz (2006) implies that lead firms may curtail the amount of knowledge they share with their suppliers to forestall future competition from their suppliers. In the case of PFC, I argue that a fear of future competition is not a motivation behind the restriction of knowledge since it is a subsidiary. Rather, it is likely to be the pre-existing capabilities of the subsidiary that influences what production activities the lead firm allows it to undertake. In other words, since the Thai and European factories of Thai Union are likely to already possess superior skills in tuna manufacturing, they may end up producing the sophisticated tuna products. If Thai Union were to allow PFC to produce such complex products, then they will have to make significant investments in order to raise the capabilities of their Ghanaian subsidiary to undertake such manufacturing activities. As it stands now, it appears this is not necessary since they have other production sites with adequate capabilities for that responsibility.

An implication of this argument is that, if a strong domestic sectoral innovation system existed to assist PFC to enhance its capabilities like the case of Thai firms, it may induce the transfer of more complex knowledge in the GVC chain. This postulation is backed by some of the empirical studies reviewed in Chapter 3 such as Kawakami (2007), where the initial capabilities the supplier possessed was what drove their insertion into GVCs leading to the transfer of complex skills from the lead firms.

Unlike PFC, Cosmos operates in modular GVCs, producing private label for retailers in Europe (TC1). As such, its connections with buyers are relatively weak. In fact, according to TC1, they usually engaged with agents acting on behalf of the buyers, a situation quite common in many agricultural chains (see empirical literature review in Chapter 3). Therefore, there was no training by their lead firms and communication with them was primarily through email or telephone (TC1).

The advantage of this loose relationship with its buyers is that, in sharp contrast to PFC's experience, the lead firms in Cosmos' GVC have limited control over their supplier. However, this also means that Cosmos does not enjoy the degree of knowledge-transfer that takes place in hierarchical chains such as the one PFC operates in. Instead, Cosmos is on its own, having to make its own investments to deepen its production capabilities. This burden could be

alleviated if the company operated within a robust domestic sectoral innovation system like the tuna companies in Thailand.

According to Seaman (2018), Cosmos' foreign owners directly control certain aspects of production like the case of Silla, which is now in charge of sales, a role previously undertaken by FCF. Silla has sent a representative to the firm in Ghana (Seaman, 2018). In addition, it can be argued that the Korean and Filipino expatriates occupying managerial and supervisory roles (TC1) are likely to be professionals with significant knowledge in tuna processing activities.

Cosmos also conducts its own research although this is mainly in areas like the optimisation of their manufacturing activities as well as business innovation (TC1). In addition, the local engineers at the factory receive some training from their suppliers after purchasing their machines (TC1). This initial training is usually the only one that takes place by the supplier as the local engineers can maintain the machines adequately after that (TC1). The firm also undertakes regular training of workers in various aspects of production such as the Hazard Analysis Critical Control Point (HACCP) (TC1), which is a food safety mechanism that allows anomalies in the production process to be traced and corrected (Food Standards Agency, 2017). The company also updates the skills of its workers whenever they change their technology or procedures (TC1). Some relatively low skilled workers such as those on the factory floor who possess high school certificates, can improve their skills in production through learning by doing (TC1).

***Linkage Capabilities***

Cosmos supplies to buyers mainly based in Europe including retailers like Morrisons and brands like Princes in the UK (TC1). The firm connects with its buyers during international road shows, conventions and exhibitions usually held five or six times in a year (TC1). Based on Campling (2016), I argue that the main competitive advantage Cosmos (and by extension PFC) has over its rivals including those in Asia is the preferential access that Ghana has to the EU market as a result of the Economic Partnership Agreement (EPA). For Cosmos, it was also the single most important factor accounting for its survival, as it would have to cease operations if it no longer had access to the EU market (TC1). Since the owners of Cosmos handle its sales, they are likely to be the source of knowledge relative to the development of the linkage

capabilities of the firm. In addition, the agents they interact with during the roadshows can be sources of knowledge to the firm.

For PFC, which basically operates as a factory for its lead firm, it does not face the same burden as Cosmos with regards to establishing links with its buyers. Given the tight control the parent company exerts, I expect it to control all the engagements with its consumers or retailers. Therefore, linkage capabilities of PFC in Ghana are likely to be underdeveloped.

***Market Capabilities***

The market capabilities of the Ghanaian tuna canneries are relatively under-developed due to the way they are integrated into their respective tuna GVCs. Based on Thai Union (2020), which details the company's entire corporate framework, operations in Ghana fall under its EU operations, together with Thai Union Trading Europe, "*an importer and distributer of seafood products*" (p. 66), one can argue that PFC only produces and exports to Europe with other Thai Union subsidiaries taking care of issues relating to distribution and sales. Cosmos is only a contract manufacturer for retailers in Europe and mostly interacts with agents (TC1). This means it does not undertake the marketing, distribution and sales, which are all activities associated with market capabilities. I can infer therefore that its current operations as well as the state of the sectoral innovation system it operates in do not foster the level of knowledge transfer required for the enhancement of its market capabilities.

Currently, the only avenue both firms use to develop their marketing capabilities is by supplying their own brands to the domestic market. PFC supplies the Star Kist brand (Drury O'Neill, 2013) whilst Cosmos sells its own Royal Atlantic tuna brand on the local market (TC1). However, it does not appear that the emerging tuna markets are a priority for the companies. For PFC, this must be sanctioned by Thai Union who will determine the scope of such an investment. Cosmos' current objective is to grow its client base in the EU (TC1).

### 7.3 Upgrading

#### a. Tuna fishing firms in Ghana

***Product and process upgrading***

I consider product and process upgrading together since in most cases, product upgrading requires process upgrading. In Chapter 3, I highlighted the argument brought forward by Gibbon (2001) and Ponte et al (2014) that the traditional notion of upgrading in the GVC framework is insufficient as it overlooks important activities that improves the firm's position or rents in the chain. In the tuna fishing firms, the identification of product upgrading is challenging since it is a natural product that is harvested and sold to buyers. However, by extending the concept of upgrading to cover activities that increase the firm's rents in the chain, I may identify new events that can be denoted as upgrading outcomes even though they do not fall under the traditional categories of the concept. [46] Some of these activities are increments in yield and the exploitation of higher value tuna species such as the bigeye and even bluefin tuna.

The possibility of increasing yield and/or targeting more valuable species is heavily constrained by conservation measures instituted by ICCAT to cover tuna fishing in the Atlantic Ocean and Mediterranean (International Commission for the Conservation of Atlantic Tunas, 2020). Currently, the total allowable catches (TAC) per year for the bigeye tuna is 65000 tons (International Commission for the Conservation of Atlantic Tunas, 2020). Of this figure, Ghana's allocation is 4250 tons, which is far lower than that of the EU and Japan with 16989 and 17696 tons respectively (International Commission for the Conservation of Atlantic Tunas, 2020). The TAC for yellowfin tuna is 110,000 tons (International Commission for the Conservation of Atlantic Tunas, 2020).

In addition to setting limits to the total output of tuna, there are restrictions on the number and type of vessels the countries can use to harvest the specie (International Commission for the Conservation of Atlantic Tunas, 2020). For instance, Ghana can only have 17 purse seines but no longlines whereas the EU and Japan are each allowed to operate over 200 longliners (International Commission for the Conservation of Atlantic Tunas, 2020). The provisions however, allow Ghana to substitute two pole-and-line vessels for a purse seine (International Commission for the Conservation of Atlantic Tunas, 2020). These limitations force the fishing

[46] In my view, simply asking the firms if there had been product upgrading would yield limited results since for many, the fish remains the same.

companies to stick to harvesting mainly the skipjack and yellowfin. In any case, the cost of new vessels is high for the fishing firms. A new pole-and-line could cost US$
5 million whilst the price of a new purse seine ranged between US$ 15 million to US$ 20 million (TF4).

Apart from the price of the vessels, the tuna fishing firms are reluctant to expand their fleet due to the sheer size of the operational challenges it came with. As one respondent explained to me:

> *"Generally, the fishing trend has reduced even globally and it's not worth operating many vessels that you cannot even manage. It is better to operate one vessel which you can manage. Maintaining a large fleet is expensive and includes insurance of the vessels, the crew and motivation for workers. In addition, the turnaround of the vessels must be fast (one month is too long). Most of the parts of the vessels are imported from US and Japan and the vessels must undergo dry docking every two years"* (TA1).

According to the GTA official I spoke to, a common practice called "*collaboration*", where a firm's pole-and-line boat would be used together with a purse seiner to catch the fish, had now been banned by the EU, which classified the act as transshipment. This, according to the GTA respondent, was an example of how quickly the rules changed and how such a change could affect their operations, and hence upgrading. He indicated that vessels that could return from a trip after a month were now using two months to complete a trip because of the ban on collaboration.

It can be argued that the changes in operations that are brought about by the conservation measures are forms of upgrading. However, I posit that since they are mainly aimed at sustainability of the resource rather than improvement in yield or value, it is not upgrading in the true sense of the word.

***Functional upgrading***

Since functional upgrading relates to changing functions in the chain, for tuna fishing firms, that will usually be a movement into tuna processing. Vertical integration between tuna fishing

and processing firms in Ghana is not common although some of the firms have strong ties with the canneries. For instance, Panofi has stakes in Cosmos (Seaman, 2018).

None of the fishing firms I talked to had immediate plans of diversifying into tuna processing. Among the reasons they cited for this were challenges with raising finance and the regulatory regime they had to contend it. In fact, some interviewees from the fishing companies implied that specialisation, instead of diversification, was a better strategy for the survival in the tuna industry (TA1; TF2; TF4). As one of them simply put it:

> *"The company has no plans to go into tuna processing. The company restricts itself to tuna production as that is exacting enough"* (TF4).

Some interviewees speculated that, had Myroc specialised in tuna processing alone instead of owning a cannery and a fishing firm, it may have stood a better chance of surviving (TA1; TF2).

It appears that a more viable form of functional upgrading for the fishing firms would be ownership of their own cold stores for the storage of fish which would give them greater control over their output (TA1; TF2).[47] As one respondent put it:

> *"It is convenient and easier if you have your own cold store. If we cannot sell our fish immediately, we can store them and during the lean season, we release them. Most of us now are small companies and we are forced to pay for storage"* (TA1)

Currently, only one fishing company has a cold store (TA1).

**b. Tuna Processing Firms**

**i. Thailand**

***Product and process upgrading***

[47] This may be identified as process upgrading but I consider it as some form of functional upgrading because some studies such as Drury O'Neill (2013) identify the storage of the fish as a stage in the tuna chain.

In order to identify whether product upgrading has taken place in tuna processors, I make a distinction between what I call basic and complex tuna products. The basic tuna product is the one packed in cans containing water, brine or oil. I call them basic because these are the classic tuna products that are usually manufactured by most tuna firms.

The complex ones range from those that just include extra items like vegetables in the cans to tuna snacks or ready-to-eat meals. I describe these products as *"value-added"* in Table 16. Since all the firms produce the classic products, I do not include this category of products in the table. As the table shows, many of the Thai firms produce different types of value-added products including tuna sauces, tuna sandwiches, tuna snack bits, tuna spreads, tuna pasta, tuna salads and even full meals such as rice and tuna.

Table 16 Complex Tuna Products by Some Selected Thai Processors

| Company | Value added (Tuna Product) | Packaging |
|---|---|---|
| Thai Union | tuna pasta, tuna infusions, tuna spreads, tuna dressing | can, pouch, pot and lid (easy-peal foil and re-sealable lid) |
| Sea Value | Tuna mayonnaise, tuna sauces, tuna mixed salad, tuna pasta, tuna Thai curry; tuna vegetables, tuna snack kit, tuna sandwich spread | Pouch, plastic cup (easy peel) |
| Chotiwat Manufacturing | Tuna vegetable broth, tuna sauce, tuna vegetables, tuna potato, tuna pepper, tuna mayonnaise, tuna curry paste, | can, pouch, plastic cup |
| Southeast Asian Packaging & Canning | Tuna onion sauce, tuna parsley, tuna mayonnaise, tuna sandwich | can, pouch, plastic cup |
| Asian Alliance International | Tuna mayonnaise, tuna salad, tuna curry | can, pouch; (plastic cup for petfood) |
| Pattaya Food | meal (rice, pasta, noodle with tuna), tuna sauce, tuna soups, snack bits | can, pouch, plastic cup |
| MMP International | … | can |
| Siam International Food | Tuna vegetables, tuna curry paste, tuna salad dressing, mayonnaise | can, pouch |
| S.K. Foods | … | can, pouch, plastic cup |
| S.P.A International Food Group | … | can, pouch, glass |
| Tropical Canning Public | ready-to-eat products | |

| | | |
|---|---|---|
| AEC Canning | | can |
| ABD Khan | Tuna mayonnaise, tuna dressing sauce, tuna tomato sauce, tuna lemon and pepper, smoked tuna, tuna salad | can |
| Diamond Food Product | meize, black olive, pepper, chili, basil, rosemary | |
| Premier Canning | Tuna sauces | can, pouch |
| SiamTin Food Products Co. Ltd | … | can, pouch |

Source: Author based on information from websites of firms

I argue that the ability of the Thai firms, including the small ones, to produce these products implies that the skills necessary to create them are widespread in the tuna cluster in the country. This is due to Thailand's more sophisticated sectoral innovation system. Authors such as Intarakumnerd et al (2015) and Murray (2007) have identified some factors that have stimulated food innovations in Thailand which include: 1) Thailand's vast array of traditional food recipes out of which new products can be developed; 2) an increase in demand for packaged food products as many supermarkets and other retail outlets have grown in number; and 3) increasing demand for more sophisticated food products by Thai consumers.

Another form of product upgrading is the changes in the forms of packaging. Some of the Thai firms now use modern packaging materials like pouches and plastic cups as can be seen in Table 16. These forms of packaging have the advantage of being lighter and easier to carry around compared to cans.

Although I do not find explicit information on process upgrading on the website of the firms, I argue that the development of new products including the use of new packaging materials is indicative of process upgrading.

***Functional Upgrading***

Functional upgrading by the tuna processors involves rising to lead firm status from their current positions as first tier suppliers. This means that the Thai tuna companies will supply their tuna brands in the mature tuna markets and be in control of their GVCs. I already

mentioned that currently, only two Thai tuna canneries, Thai Union and Sea Value, have a significant presence in the important tuna markets of the USA, the EU and Japan.

However, out of the two firms, only one, Thai Union, owns powerful brands in the advanced markets. Sea Value on the other hand is mainly a contract manufacturer even though it currently owns a processing facility in France (SeaValue, 2020). Since conventional GVC theory suggests that it is the acquisition of skills by a supplier from its lead firm that promotes the functional upgrading of the former into the position of the latter, one can expect many of the Thai tuna firms involved in GVCs to rise to become lead firms.

Thai Union and Sea Value present an interesting case of two large firms that are intricately involved in tuna GVCs, but one experiences functional upgrading whilst the other does not. However, Thai Union's functional upgrading does not align with the GVC postulation since there was no automatic shift from first-tier supplier to lead firm position. Instead, the firm forced its way to the top of the chain by acquiring lead firms (Campling, 2012; Fundinguniverse.com, 2020; Pananond, 2013; Thai Union, 2019a, 2020). In some cases, such as its acquisition of Van Camp Seafood, the lead firm was on the verge of bankruptcy which allowed Thai Union and its partners to step in and buy it (Fundinguniverse.com, 2020).

Although some of the smaller tuna processors also supply to European and North American countries, Table 11 shows that they have been mostly concentrating on the domestic as well as some emerging markets such as Vietnam, China, the Middle East, South American and African countries. This may be due to the strong competition they face from large firms supplying to the developed markets as well as the low entry barriers to the emerging markets. It is a tactic that has been used by firms in other chains like furniture and footwear according to Navas-Alemán (2011) (see Chapter 3). A similar observation was also made by Kadarusman (2010), who demonstrated how Indonesian garment and electronic producers turned to national and regional markets to supply to and experienced functional upgrading.[48] Navas-Alemán (2011) argues that the local and regional markets served as a platform for firms to enhance their skills at functional upgrading. I add that for the Thai tuna processors, it is their possession of superior technological capabilities due to the depth of their innovation system that makes them well placed to enter the regional and emerging markets.

[48] These studies are reviewed in Chapter 3.

### ii. Ghana

#### *Product and process upgrading*

Table 17 below shows that product upgrading (and possibly process upgrading) has not been extensive among the Ghanaian tuna processors since they do not produce the range of value-added products like firms in Thailand. The two firms primarily produce basic tuna products although according to TC1, Cosmos produces tuna in vegetable broth.

Table 17 Complex Tuna Products by Ghanaian Processors

| Company | Value Added | Packaging |
|---|---|---|
| Pioneer Food Cannery | - | Can |
| Cosmo Seafoods | Tuna in vegetable broth | Can |

Source: Author based on fieldwork and Drury O'Neill (2013)

As mentioned already, PFC's lead firm, Thai Union, determines which products are manufactured by its subsidiaries. However, data on Ghanaian tuna exports provided to this study by the Ghana Customs and Excise Preventive Service indicates that Ghana's tuna exports comprise mainly canned tuna, tuna loins and raw tuna.[49] Therefore, as also noted by Drury O'Neill (2013), it appears that the current strategy of the parent company, Thai Union, is to produce basic tuna products in Ghana, whilst the complex ones are manufactured in other locations. This suggests therefore that, in the tuna industry, the possession of multiple production sites by the lead firm has led to a segmentation of product upgrading where some subsidiaries are chosen to produce more sophisticated products whilst others are stuck with producing the low value tuna products.

This arrangement will potentially last as long as Thai Union, the lead firm, continues to include the low-value tuna product in its product mix. Therefore, it can be argued that if the lead firm drops the basic tuna product to focus on high value tuna products, PFC, may receive the training to enhance its capabilities to undergo the product upgrading. It is also possible that instead of making the investments to raise the capabilities of PFC, the parent company may just sell the

[49] Data was from January 2014 to September 2018.

subsidiary to another tuna firm interested in operating in the low-value section of the tuna market.[50]

Despite the challenges associated with upgrading in the GVC, product upgrading can be observed with PFC's Star Kist brand supplied to the local market, with its improved packaging and even the inclusion of vegetables (kpakpo shito) in the can (Modern Ghana, 2010). The Ghanaian market is however too small to stimulate the development of more complex products like ready-to-eat meals or tuna snacks.

Cosmos, whose lead firm has weaker control over its activities, has a greater scope than PFC to develop new products. However, as I have hinted already, the development of its capabilities to produce sophisticated tuna products may be curtailed by the weak sectoral innovation system it operates in. Since the company must bear most of the burden of developing its own capabilities, the resulting product upgrading in terms of variety of tuna products and improved packaging has been weak.

***Functional Upgrading***

Based on my understanding of functional upgrading in the tuna industry, the Ghanaian tuna firms have not undergone any functional upgrading and remain stuck at the same level of the tuna GVC. PFC, for instance, has maintained its position in a hierarchical governance structure since its inception more than forty years ago. This governance structure gives the lead firm complete power to prevent functional upgrading by the subsidiary.

Therefore, it is Cosmos Seafood that can realistically achieve functional upgrading since its lead firm (retailers) are less likely to obstruct its efforts. However, the company's paramount concern is strengthening its position in the GVC by increasing its orders from the EU rather than attempting to move up in the chain. In a news report, the company's sales executive hinted that in the future they would consider "*buying a small brand in the EU to get a foothold*" (Seaman, 2018). This reinforces the idea that the most plausible method of functional upgrading in the tuna chain is the acquisition of lead firms based in the advanced markets. At

[50] Campling (2012) hints that the PFC is only valuable to Thai Union due to Ghana's preferential access to the EU market and that an erosion of this advantage may see the company moving its production to Thailand.

the same time, it undermines the conventional wisdom that it is the possession of technological capabilities that spurs functional upgrading in GVCs. In Chapter 4, I indicated that investment firms and fishing firms have at different times become lead firms by acquiring major tuna manufacturing companies. The fact that the owners of Cosmos are mulling the possibility of acquiring a European tuna brand in future to improve its position in the chain underscores this point. [51]

Unlike the Thai firms, however, the Ghanaian tuna companies are not actively exploring regional and other non-traditional tuna markets.[52] I argue that this does not form a major component of the strategies of the foreign owners of the canneries since their primary objective is to maximise exports to the EU market given Ghana's preferential access.

## 7.4 Social Aspects of Participation in Tuna GVCs

In Chapter 3, I indicated that one weakness of the GVC framework is its inability to adequately incorporate some social and political elements that influence activities in the chain. In this section, I consider two of the social elements, namely income (value) distribution in the chain as well as the concept of social upgrading, postulated by Barrientos et al (2011).

### a. Distribution of value in the tuna GVC

#### i. Thailand

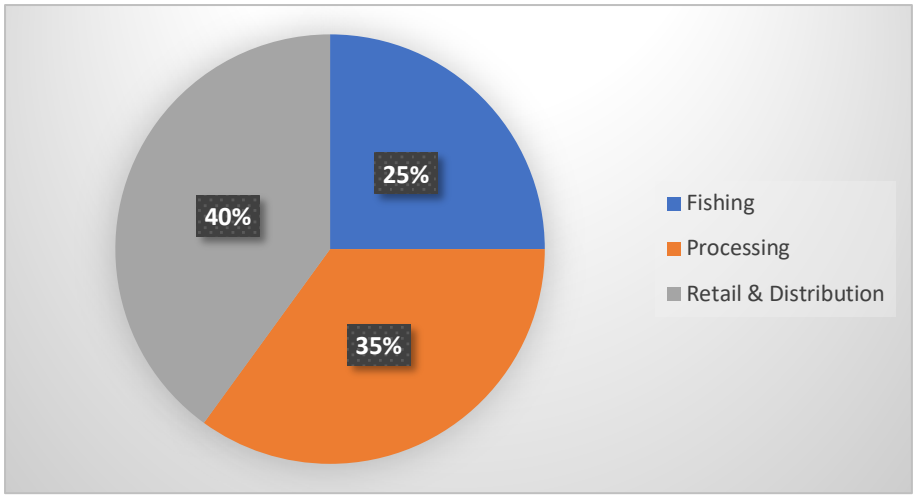
Figure 20 below depicts the distribution of income in the tuna GVCs that Thai firms participate in. According to the data, about 40 percent of the income in the chain is captured by the retailers and distributers, who are mostly based in the developed economies. 35 percent of the value in the chain accrues to the Thai processors whilst the remaining 25 percent is generated by the tuna fishers. This suggests that a greater proportion of the about 65 percent of the income

[51] Cosmos has foreign owners and so even if they acquire an European brand to achieve functional upgrading, there is no guarantee that the local firm in Ghana will be the headquarters. However, the main point here is that suppliers in developing countries can rise quickly to the top of the chain without necessarily possessing sophisticated technological capabilities.

[52] According to Modern Ghana (2010), PFC's Star Kist is also supplied to the West African market. Despite this, I do not find strong evidence of a deliberate strategy by PFC to expand into regional markets.

generated in the chain by the tuna fishing companies and the retailers and distributers accrues to foreign players given their dominance in those nodes of the chain.

Figure 20 Thailand Share of Value in Tuna GVC




Source: The Asia Foundation and International Labour Organization (2015 p. 45)[53]

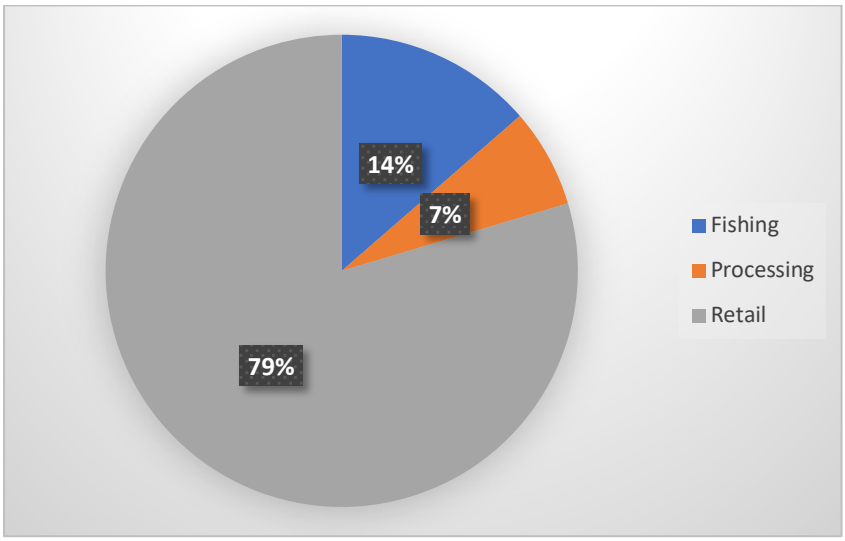
The analysis implies that despite Thailand's strong performance in tuna manufacturing and export, the rents that accrue to it in the chain are modest. Therefore, by analysing income distribution, the true benefits from engaging in GVCs become obvious. Thai firms have sought to extract more value from the chain by investing in the retail segment. An example is the case of Thai Union investing in retail outlets such as Thammachart in Thailand as well as Red Lobster, which owns a chain of restaurants in the US (Thai Union, 2019a).

### ii. Ghana

Figures 21 below shows income distribution in the tuna GVC involving Ghanaian firms.

[53] The authors rely on data on gross margins from Thai Union and Sea Value.

Figure 21 Ghana Share of Value in Tuna GVC




Source: Author's illustration. Calculations based on Tables 4.10, 4.11 and 4.12 in Drury O'Neill (2013, pp. 73-74)[54]

From the chart, the retail stage dominates the chain (about 79 percent) in terms of the generation of value or income. Tuna processing only accounts for 7 percent of the value in the chain whilst tuna fishing represents just about 14 percent of the total value created in the chain. What is interesting is that even though Ghanaian firms dominate the fishing and processing nodes, the cumulative value accruing to the country is just about 21 percent. In contrast, even though the Thai firms dominate only the tuna processing node of their GVCs, they contribute about 35 percent of the value created in those chains. This underscores Thailand's superior performance in tuna GVCs.

The low value that Ghana generates from the tuna GVC undermines the suggestion that merely increasing participation in GVCs leads to benefits for developing countries. The Thai firms have increased their share of the income in the chain by producing higher value tuna products. As I have already indicated, this can be attributed to their superior sectoral innovation system which has led to the greater deepening of their technological capabilities compared to Ghanaian firms.

[54] Value addition was computed for each stage of the chain by finding the difference between the average selling price per metric ton of the product at that stage from the preceding one as provided in the tables (for fishing stage, average cost of the firm was deducted from the average selling price per metric ton). The calculations are based on tuna produced by purse seines which are exported to foreign buyers.

### b. Social Upgrading

With reference to Barrientos et al.'s (2011) social upgrading framework, I assess the conditions of vulnerable workers in Ghana's tuna fishing industry. I focus on only Ghana's tuna fishing industry mainly because of the availability of data on Ghana's tuna fishing sector from my fieldwork. In addition, according to the cannery and trade union group representatives I interacted with, Ghanaian factory workers in the canneries receive stronger protection from the relevant labour laws, have employment contracts and are unionised, which reduces the vulnerabilities associated with their job. They even appear to have greater job security than their Thai counterparts, who tend to be comprised of migrants and children, leading to frequent labour right scandals (The Asia Foundation and ILO, 2015). Therefore, an examination of the vulnerable workers involved in tuna fishing is justified.

#### i. Vulnerable workers in tuna fishing

The fishing crew usually had employment contracts with the fishing firms their conditions of service were usually negotiated with their trade unions (TA1; TF4). The fishing companies also paid the pensions of the fishing crew as stipulated in labour laws (TF4; TA3). Given the sensitive nature of labour issues – particularly for international NGOs – the tuna fishing firms endeavoured to provide good working conditions for their workers (TA1). In the words of one respondent:

> *"Our buyers, like the canners, say that the EU are demanding certain conditionalities and apart from the hygiene issues, they are concerned with certain ethical practices or standards to see whether they conform to international standards. We have had lots of confrontations with NGOs who are trying to find out whether fish caught is safe, traceability etc. There are periodic audits too. They go on board to interview the crew, check whether they have access to hospitals etc. The company pays for their health insurance and hospital bills, including their children. They always come here with their hospital forms and it is not unique to this company. Now every company is doing the health insurance"* (TA1)

Despite these protections, I still regard the fishermen to be very vulnerable for reasons elaborated below.

According to an official of GTA, despite possessing employment contracts, the fishermen were not stable as they could suddenly leave one firm for another in pursuit of a higher bonus (TA1). This situation affects whatever investments the firm could potentially make in them since they were always on the move.

According to TF1, TF2 and TF3, their firms paid the fishermen the prevailing minimum wage. The fishermen then earned a bonus, which was calculated based on the fish caught (TF2). However, no standard rate of bonuses was applied, and it was up to the captain to determine how much each fisherman got as bonus based on his judgment of his performance (TF2). This structure of wages by the fishing companies compromises the pensions of the fishermen, according to an official of the National Fishermen Association of Ghana. He suggested that since pension contributions in Ghana are based on the basic salary of a worker, low salaries meant that the fishermen would be negatively affected in the long term even if they were making greater returns from bonuses today.

Table 18 below shows the monthly wage structure of a tuna fishing firm in 2013, presented by Drury O'Neill (2013). The table indicates a large disparity between the wages of high skilled workers, i.e. captains and engineers, who are often expatriates, and that of fishermen, who are Ghanaian.

Table 18 Monthly Wage Structure of Tuna Fishing Crew 2013 ($)

| Crew | Baseline Salary | Fishing Bonus per Metric Ton | Landing Allowance |
|---|---|---|---|
| Captain | 2000-5000 | 50 | ±1000 |
| Chief Engineer | 1500-4000 | 30 | ±500 |
| Chief Officer | 1300-2000 | 15 | ±300 |
| 2nd Engineer | 1000-2000 | 15 | ±300 |
| 2nd officer | 1000-2000 | 15 | ±300 |
| Fishermen | 100-200 | 5 | ±100 |

Source: Drury O'Neill (2013, p. 38)

An official of the National Fishermen Association of Ghana, TA3, asserted that across Ghana's fisheries, fishermen were vulnerable because of their role in the value chain. He argued that in the artisanal sector, those who did not own the boats only got a fraction of the income generated despite performing the arduous tasks. In the industrial fisheries, the situation of the fishermen was fragile because as fishing companies, including the tuna firms, faced higher costs, particularly from the unstable price of marine oil, which constitutes about 70 percent of input costs, the owners of the fishing companies squeezed the wages of the fishermen in order to protect their share of the income (TA3).

It can also be argued that if the tuna fishing company were to switch to more mechanised fishing gears or technologies, it is the fishermen that may suffer some retrenchment in their employment and/or wages. These arguments highlight some form of social downgrading according to the arguments of Barrientos et al. (2011). The precarious situation of the fishermen is accentuated by the decline in the country's fisheries. This argument is expanded next.

### ii. Impact of collapsing fisheries

The tuna fisheries usually employ fishermen from the artisanal sector (Drury O'Neill, 2013). As the artisanal sector has declined, it has increased the vulnerability of the fishermen, making them overly dependent on the tuna industry. The collapse of the fisheries is mainly instigated by the activities of the industrial trawlers. As one fishery expert put it:

> *"The base cause (of depleting stocks) is that although the artisanal fishermen have something to answer for, the major fishing effort is done by the foreign Chinese trawlers. These trawlers are non-selective and so they catch everything in their path as the trawl nets are dragged along the sea bottom depleting the area they pass"* (R5).

According to another fishery expert I spoke to, R3, foreigners have taken advantage of a loophole that allows them to temporarily own vessels in the industrial trawl sector on a hire purchase basis whereby ownership is transferred to a Ghanaian after five years. The foreign operators, 90 percent of whom are Chinese (Environmental Justice Foundation and Hen Mpoano, 2019), have exploited this provision through schemes like deliberately folding up the company close to the expiration of the hire purchase agreement only to enter into a fresh one

after a new registration of the firm (R3). When the local partner eventually possessed the vessel, it was usually run down and not fit for use (TA3; R3).

The industrial trawlers adopt illegal practices which compromise the sustainability of the country's fish resource (R5). One of such practices is referred to as 'Saiko', and it involves the trawler, a vessel supposed to produce demersal fish, harvesting pelagic fish like mackerel and selling them at sea to the artisanal fishermen (who are the ones permitted by law to hunt for pelagic fish) (Environmental Justice Foundation and Hen Mpoano, 2019). A comprehensive report by the Environmental Justice Foundation and Hen Mpoano (2019) on this practice in Ghana showed that at least $40 million worth of pelagic fish was sold to the artisanal fishers in 2017. The report suggests that about 60 percent of the catches of the trawlers are attributable to this practice and that the official catch statistics of the industrial trawlers in Ghana could be undervalued by about nine times the actual number. The implication for the state, according to the report, was lost revenue which were repatriated by the foreigners. Another significant finding by the report is how the activity is affecting the livelihood of the local fishermen. The report indicates that by using trawlers to harvest these pelagic fish and selling them to a few canoes, the fish resources of the country were in effect under the control of a few powerful players leading to the impoverishment of many of the 100,000 fishermen. At the same time, by using such industrial vessels to harvest pelagic species, the fish resources were depleting at a faster rate which was threatening the livelihood of the local fishermen (Environmental Justice Foundation and Hen Mpoano, 2019).

According to a fishery expert, R5, the deteriorating situation of Ghana's fisheries was disproportionately affecting the fishermen. He argued that the other players in the local supply chain, such as the traders and local processors, have now resorted to importing the fish, which are prepared and sold to consumers as if they were caught in Ghana. When I asked why these illegal practices in the Ghanaian fisheries persisted, the fishery expert, R3, told me that the state generally lacked the will to clamp down on the activities of the Chinese fishers. He alluded to corruption as the motivation for the lack of sufficient action from the state and described the situation as follows:

> *"The root cause of the problem is that those making the decisions about fisheries do not want the public to understand how the fisheries work. This problem also relates to other natural resources. They don't want you to know*

*how much gold we take from the earth; how much money we get from the gold or how much of it goes out. People always want to think of natural resources as something free that a few groups can just grab and make money from. The same thing applies to fisheries.*

*Every trawl vessel has a politician behind it because trawl vessels fly Ghana flags and are supposed to be owned by Ghanaians but all but one of these vessels are owned by Chinese and they are those taking decisions in the vessels. All the people at the top (vessel crew) are Chinese who make the decisions and then report what they want to one Ghanaian in the vessel and tell him to tell others. These vessels are supposed to be on hire purchase where a Ghanaian is supposed to own at least 51% but the Ghanaian is just fronting. Every time they come they just give some money and some quantity of the fish they catch to him (which this is less than 5% of the amount of rent they make) and then whichever politician is backing them so when they are caught he helps them out. All the money made is taken to China. Governments don't want people to know the level of corruption going on in the fisheries. It's just a few people making a big cut in rents being generated and they want people to look the other way"* (R3, 8th November, 2018)

Apart from the problems emanating from the collapse in fisheries, there are other factors that affect the declining standard of living of fishermen. This includes the poor saving culture of the fishermen due to their treatment of their revenues from fisheries as windfall (R3). In addition, they appear not to have diverse set of skills to allow them move into alternative occupations as was evidenced in 2018 when the government sought to enforce a ban on fishing in order to support the conservation of the fish species (Frimpong, 2018). The strong opposition from the fishermen to the ban was mainly on the basis that they had no alternative means to support their livelihoods (Frimpong, 2018).

## 7.5 Conclusion

In this chapter, I have used the sectoral innovation system framework to examine how tuna firms build up their technological capabilities, whilst operating in GVCs, in order to upgrade. The objective of this approach is to verify if the GVC is the main vehicle through which tuna suppliers from Ghana and Thailand promote their capabilities.

My analysis has shown that for the tuna fishing firms in Ghana, their most significant sources of knowledge are the foreign owners and workers they hire, as these agents come with their extensive knowledge of tuna fishing activities developed from operations in their home countries. These agents affect the development of both the investment and production capabilities of the firm. The tuna fishing firms also rely on the knowledge that is diffused within the cluster or from the Ghana Tuna Association. The state agencies and multilateral bodies also offer critical knowledge that enhance the technological capabilities of the firms.

I have argued that some of the entrepreneurs that established tuna processors in Thailand accumulated knowledge from other industrial undertakings which were then applied to the tuna processing industry. In addition, knowledge flows within the cluster which contains large firms with the resources to conduct R&D. The Thai tuna firms also receive knowledge from suppliers and state agencies. The lead firms in the GVCs, particularly the ex-tuna manufacturers, were instrumental in raising the capabilities of the Thai firms at the early stages of the industry to supply to mature tuna markets.

With regards to the Ghanaian tuna processors, I find that their sectoral innovation system is not extensive as it involves fewer participants with weaker connections to the firms. This situation has made one cannery, PFC, which is involved in a hierarchical chain, dependent on its lead firm for the enhancement of its capabilities. The other tuna processor, Cosmos, is forced to shoulder most of the burden of improving its technological capabilities since its buyers (the retailers) are unable to step in to fill the knowledge gap created by the absence of a robust sectoral innovation system.

I indicate that the Ghanaian tuna fishing companies are constrained in their upgrading efforts by the strict regulatory regime guiding their activities that aims to ensure the sustainability of the tuna fish. In addition, most firms have no plans to enter tuna processing since it will stretch their resources and potentially lead to their collapse.

I argue that Thailand's deeper sectoral innovation system has resulted in superior technological capabilities of its tuna processors evidenced by their upgrading in the tuna chain. They can produce a wide array of tuna products with modern packaging methods which attract higher value. Amongst the tuna processors, Thai Union is the one that has achieved functional

upgrading, albeit through unorthodox means (that is through acquisitions instead of an organic rise in the chain). Many of the smaller tuna processors have turned to emerging tuna markets in Asia, Africa and the Middle East. The Ghanaian tuna processors, on the other hand, are mainly stuck at the same level of the tuna GVC, producing the relatively low value tuna packed in cans.

Finally, I have shown that the share of the income that accrues to Ghana in the tuna chain is meagre compared to Thailand which, even though it mainly occupies the processing node, still generates greater value than Ghana. I suggest that Thailand's performance is mainly due to the production of higher value products owing to its superior technological capabilities. I also indicate that in the Ghanaian tuna industry, the fishermen are the most vulnerable workers, and the deteriorating nature of the country's domestic fisheries makes their situation perilous.

# Chapter Eight

## Linkages

### 8.0 Introduction

In this chapter, I analyse the linkages that have formed between the tuna industry and other sectors of the economy. The basis of this exercise is to examine whether participation in GVCs prevents the formation of enclave industries. It is also to assess whether insertion into one value chain can spur the emergence and/or development of other industries.

By incorporating the concept of horizontal linkages (see Morris et al., 2011) into the framework, I can assess whether the skills, knowledge and technological capabilities developed in the tuna industry can be dispersed to other sectors of the economy that are not directly involved in tuna manufacturing.[55]

I use the production linkages framework developed by Hirschman (1958) and include the concept of horizontal linkages. The tuna processing firm is used as the starting point based on which the linkages are assessed. I also extend my analysis to cover some secondary linkages that are created from the primary ones (those that form directly from the tuna processors). This includes ship/boat making, which connects to tuna fishing. The forward linkages I consider in this chapter are mainly the domestic distribution and marketing companies, which I collectively call "trading companies", whilst the backward linkages are the tuna fishing companies.

When it comes to horizontal linkages, I consider two paths; those that connect the tuna processing firms to what I refer to as "related industries", and the ones that link to "unrelated industries". My understanding of related industries or sectors includes those that belong to the same "family" as the tuna firms such as agro-processing firms. My interest is to find out the ease with which skills gained in one activity, say tuna processing, can be transferred to those activities. I compare this to the linkage that connects to firms in unrelated industries; that is those industries further away from tuna processing such as electronics.

[55] I use my analysis on horizontal linkages also to represent discussions on inter-sectoral upgrading.

This chapter is subdivided into five main sections. The next section contains my discourse on backward linkages where I examine how tuna fishing companies and the component suppliers are linked to the tuna processors in Thailand and Ghana. I also consider secondary linkages such as the ship or boat making companies. Section 8.2 explores the forward linkages which are created in the tuna industries of Thailand and Ghana (i.e. the trading companies). The horizontal linkages are deliberated in Section 8.3 where I examine the linkages to the industries that are related and unrelated to the tuna processing firms in Thailand and Ghana. Section 8.4 presents concluding remarks.

## 8.1 Backward Linkages of Tuna Processing

### a. Thailand

#### i. Tuna Fishing

In Chapter 6, I indicated that the Thai tuna canneries mainly imported their tuna fish (Hamilton et al. 2011; The Asia Foundation and ILO, 2015). This weak link between the domestic tuna processing and fishing sectors is not due to a weak fishery sector in Thailand (I already established in Chapter 6 that Thailand is an important global fish producer). Rather, I argue that due to Thailand's location, which affords it abundant access to large volumes of tuna caught in the Pacific and Indian Oceans (Crough, 1987; Hamilton et al., 2011), it is cheaper for the canneries to buy their raw materials on the market than to invest in tuna fishing activities. It was mentioned in Chapter 4 that the high costs involved in tuna production (including cost of vessels, competition and regulations) lowered the incentive for many canneries to be vertically integrated into fishing companies (Corey, 1990). I believe this also applies to the Thai firms.

Outside the tuna industry, I find that the other fish producers in Thailand are strongly associated with domestic canneries as was established in Chapter 6. Since most of the Thai tuna processors also process other fish such as mackerel and sardines (as shown in Table 11), it implies that although a domestic tuna fishery is weakly connected to tuna processing, the broader fisheries sector is strongly linked to the tuna processing industry.

For developing countries like Thailand, that own significant quantities of natural resources and raw materials, agro-processing activities can serve as their entry point into industrial development. This was noted by Simon (1996), who argued that the bulk of Thailand's initial manufacturing activities were in agro-processing activities including seafood production. It underscores how agro-processing connects the primary and secondary sectors of the economy. This linkage is spurred by the low entry barriers to food processing, including the relatively easy access to technology which can simply be imported from suppliers (Kohpaiboon, 2006).

The foregoing also implies that fish production and processing, both of which are labour-intensive, can potentially boost labour employment significantly. However, this is not necessarily the case in Thailand which suffers from an acute scarcity of domestic labour in its fishery sector leading to dependence on foreign workers (ILO, 2019). In a bid to curtail the exploitation of cheap migrant labour (including child labour) so as to avoid international sanctions, the Thai state has tightened labour laws which has had the unintended consequence of raising the cost of production for the firms in the sector (ILO, 2019).

Even if the benefit of labour employment has not been fully exploited in Thailand, this connection between the fishing and processing sectors is still important due to the mutual dependence of the two sectors on each other. Thailand's strength in food manufacturing provides a ready market for the fish producers whilst the presence of domestic fish production fosters regular supply of raw material and reduces their dependence on imports.

The linkage between fishing and processing also offers Thai investors the opportunity to diversify their portfolio and increase their profitability. This in turn allows them to fund their entry into more complex manufacturing industries. I explore this under section 8.3.

***Secondary linkages to tuna fishing: Boat-making industry***

According to Panaĭotov and Jetanavanich (1987), it was the shift to modern fishing vessels that led to the commercialisation of Thailand's fisheries which demonstrates the link between commercial fisheries and the ship-making industry. This connection is relevant as it shows that linkages formed in agro-processing industries, particularly fisheries, can be potentially as extensive as those in other industrial sectors.

Despite this, available evidence shows that Thailand has not fully taken advantage of this potential linkage. Mocci (2017) indicates that prior to the industrial revolution, Thailand was a dominant player in the ship making industry, producing boats from wood and fibre glass. The author argues that the country's industry was unable to make the transformation to "*steel hulls and steam engines*" (p. 566) due to limited investments from the state which has left it behind other powerful Asian manufacturers. Currently, many of the companies still produce "*small wooden riverine ships, fishing boats or small fibre glass boats*" (Mocci, 2017, p. 578).

Despite the slow growth in the capabilities of the industry in general, there are examples of ship manufacturing firms that first started building simple boats but have accumulated resources and capabilities to move into the production of more complex boats. For instance, an account of the development of a ship-making company on the Global Security website shows how the ship maker, Marsun, started out constructing vessels from fibre glass and enriched its capabilities to undertake the construction of more sophisticated vessels such as passenger ferries and military boats like patrol boats using complex materials like steel and aluminum (Global Security, n.d). This suggests that the fishing industry in general and tuna fishing in particular can potentially serve as an entry point for firms in the ship-building industry.

Following my discussions in Chapter 7, I can infer that Thailand's challenges in promoting its domestic ship manufacturing sector suggests that its sectoral innovation system for ship making is not strong.

### ii. Component Suppliers

As noted in the previous chapter, the emergence and growth of supporting firms such as machine and food packaging suppliers in the tuna industry of Thailand suggests that the establishment of agro-processing activities, including the tuna cannery, spurred the development of the food machinery industry in Thailand. In this regard, Simon (1996) refers to the observation that the first industries that emerged in Thailand's industrialisation drive in the 1970s and 1980s were the food processing, textiles and machinery industries (p. 84). He argues that manufacturing in Thailand at this time was driven largely by the agro-processing industries, with several of the firms being small scale. His analysis suggests that the machinery

industry emerged primarily for servicing other manufacturing activities (particularly agro-processing) that were in operation. He provides a synopsis of the agricultural machinery industry which suggests that the local machine producers started off their operations going through the process of 'learning-by-doing', initially with basic or intermediate knowledge in metal work, often relying on their own creative skills or copying existing ideas to manufacture machines required by their local customers.

Simon (1996) suggests that the take-off of Thai manufacturing and by extension the machinery industry was not stimulated by a deliberate state strategy. It seems that the country's manufacturing sector boomed in spite of this low state assistance due to favourable conditions such as strong local demand which spurred investments by local producers (Simon, 1996). However, other studies such as Crough (1987) have stressed the role of the state in engendering economic activities through schemes such as the BOI's investment programme. Thailand also experienced a surge in participation in multiple manufacturing GVCs partly due to some fortuitous factors such as its location, which made it attractive for Japanese manufacturers looking for alternatives to China (due to frayed relations between the two countries) to outsource their production (Hays, 2008).

Regardless of where one stands in the debate over the extent of the role played by the state in developing the machinery industry, what is clear is that efforts have been insufficient as the BOI reports that the Thai machinery industry is quite behind when it comes to advanced technology and capabilities, and the large companies tend to purchase machines from foreign producers (BOI, n.d).

### b. Ghana

#### i. Tuna Fishing

In Ghana, the main commercial fishery activity that is linked to domestic fish processing is tuna production. The fishing firms I interacted with reported different sizes of their workforce. The smallest size was reported by TF1, who had 45 employees, including the fishermen on the vessels. TF4 had the largest number of reported employees in my study, with 111 employees, 93 of them being fishermen. TF2 had 90 workers, with about 83 of them working on the vessels

whilst TF3 had 80 workers at the firm. According to TC1, Cosmos employed almost 1000 workers. These figures imply that tuna production and processing have improved the employment of local workers including the fishermen and artisans operating on the vessels. It has also boosted female employment since women are mainly the ones who work on the "*factory floors*" in the canneries (Drury O'Neill, 2013. p. 54).

Although the wages of the tuna fishermen are not necessarily higher than their colleagues in other fisheries, the tuna jobs appear more secure since, as noted in the previous chapter, the fishermen, through the unions, are able to negotiate their conditions of service and receive some protection under the relevant labour laws.[56] According to Drury O'Neill (2013), factory workers can stay with a cannery for as long as 20 years.

In addition, from the discussions in Chapters 6 and 7, Ghana's domestic tuna production and processing sectors are more connected to each other compared to Thailand. As was indicated in the previous chapter, the Ghanaian fishing companies find it more convenient selling to the local canneries than exporting them (TA1; TF2; TF4), especially as tuna prices are based on the world market price (TA1). The canneries are also locked into a dependence on local tuna fishing companies because their tuna products must meet the rules of origin provisions in Ghana's trade deal with the EU, outlined in European Commission (2014).

With regards to the broader fishery sector, there are two main ways that the tuna industry (particularly tuna fishing) and other fisheries in Ghana are linked. The first is that the fishermen that are employed by the tuna vessels first accumulate their knowledge and experience in the artisanal sector (Drury O'Neill, 2013). Second, the artisanal fisheries are the suppliers of the bait fish (anchovies) used for tuna fishing (R5; TF1).

However, a third potential linkage may be the transfer of knowledge on the conservation and safe production practices from the tuna firms to the artisanal fishers. This type of linkage has not been fully exploited as was established in my interview with officials of the Ghana Standards Authority. The GSA, which receives regular training from the EU to ensure that the fishing and processing of tuna meet the requisite food safety standards, is unable to extend the

[56] In Chapter 7, I discussed how despite these protections, the fishermen were considered vulnerable.

knowledge to other fisheries because they (fisheries) do not fall under their remit but rather, the Food and Drugs Authority (FDA) (TA4).

***Secondary linkages to tuna fishing: Boat-making industry***

Since the tuna fishing companies import their vessels (TF2; TF3, TF4), linkages with the local boat-making sector are basically non-existent. According to Connell (2001), Ghana once had a robust domestic boat-making sector that supplied commercial vessels to fishers for fish production. He indicates that until the 1980s, there were several boat manufacturers along Ghana's coast, with four based in Tema. However, as the fishery sector deteriorated and profits dwindled, the boat-making industry also declined significantly owing to the fall in demand (Connell, 2001). The author also opined that the vessels that were produced were mostly wooden and some of the manufacturers had gained production knowledge from their previous work in Europe.

The collapse of the boat-making industry has resulted in the canoe manufacturers serving as the main domestic vessel producers which demonstrates how the fisheries sector in general is linked to the craft/carpentry and wood sectors (Connell, 2001). Connell (2001) reports that the construction of the canoes is undertaken by skilled carpenters (using wood from the Wawa tree) who utilise basic tools for carving the wood.

The wood carvers have not upgraded into the manufacturing of more complex fishing and non-fishing vessels. From Connell (2001)'s description of the canoe-manufacturing process, the skills possessed by the carpenters are basic carving skills and they do not possess the knowledge and financial resources to upgrade to more complex boat or ship manufacturing.

### ii. Component Suppliers

The representative of the cannery I interviewed told me that the machinery used for their production cannot be manufactured locally.[57] This indicates that there is a weak linkage between the tuna processors and machine producers.

[57] I was told by a representative from a cannery that they sourced their cans locally but I was unable to locate the supplier. In any case, I do not think this industry is as robust as the case in Thailand especially as Ghana's food processing industry is weak (Owoo and Lambon-Quayefio, 2017).

In order to investigate this weak linkage between the canneries and local machine producers, I visited Ghana's largest cluster of talented local artisans that produce machines for small scale firms based in Suame, Kumasi (NT4). Officials of the association that represents these artisans, NT4, informed me that most of the artisans had only basic or secondary school education although a few of them held certificates from polytechnics. The main mode of learning in the cluster is through apprenticeships although the association periodically organises training programmes to get the artisans acquainted with new technologies or health and safety measures (NT4). There was, however, no formal engagement with educational institutions such as polytechnics (NT4). The artisans that have some tertiary education in the polytechnics and universities can combine their technical training in from the schools with the practical knowledge obtained within the cluster to become well rounded (NT4).

Most of the clients of the artisans are small scale manufacturers although there have been occasions where large firms have sought their services (NT4). According to the representatives of the association, the process of producing for a client is straightforward: the buyer first approaches the artisan with the problem based on which the artisan makes the design of the solution (NT4). Once approved by the client, the artisan goes ahead to make the product (NT4). The artisans usually rely on their own experience and/or creativity in proposing solutions to their client's problems but they sometimes consult other producers within the cluster for ideas (NT4).

State support for the artisans has been inadequate despite numerous promises by different governments (NT4). The assistance required by the artisans includes the equipping of their workshop with modern tools and technology as well as a reduction of the import cost of machine parts (intermediate products) for manufacturing (NT4).

### 8.2 Forward Linkages

#### a. Thailand

With regards to forward linkages, I focus on the local trading companies who link the tuna canneries to their domestic and international buyers. In Thailand, the domestic market is an important component of the strategy of several tuna manufacturers as shown in Table 11. For

instance, according to Thai Union (2019), sales to the domestic market constitutes about 11 percent of its total sales in 2018. The Asian sub-region and other non-traditional markets have also become important destinations for Thai food products including tuna as is shown in Table 11.

In Chapter 3, my review of several GVC studies suggested that in some of them, the trading companies acted as first tier suppliers, controlling the rest of the chain on behalf of their buyers. In the tuna industry, it appears agents mostly play a coordinating role on behalf of the lead firms but do not yield the same level of power.[58]

This situation may be due to the powerful tuna manufacturers preferring to keep many activities in the value chain under their control than outsourcing. Thai Union has distribution companies spread globally, attending to its key markets such as Thai Union Trading Europe in the Netherlands, Thai Union China in China and Tri-Union Seafoods in North America (Thai Union, 2019, pp. 64–73). Sea Value has established Sea Value Europe and Sea Value France which act as marketers and distributors for the firm (SeaValue, n.d). In addition, the company has invested in a shipping and logistics company that handles its products (SeaValue, n.d). This vertical integration strategy ensures that the firms keep a greater portion of the rents generated in the chain and mitigates against the power of global intermediaries over suppliers.

The growth of the tuna industry in particular and the agro-processing industry in general have spurred the emergence of many trading companies in Thailand, some of which are part of the Thai Tuna Industry Association (Thai Tuna Industry Association, 2020). A few of the trading companies that are part of the TTIA are presented in Table 19. The data shows that the trading companies supply a wide range of food products. The companies also indicate on their websites that they supply both domestic and international orders including many of the emerging tuna markets. In addition, they stipulate on their websites that they are closely involved in the production of the goods to ensure that all standards are met.

[58] As noted in Chapter 4, there are major trading companies linking the fishing companies to the canneries (Hamilton et al., 2011; Lecomte et al., 2017).

Table 19 Some Trading Companies in the Agro-processing Industry in Thailand

| Company | Products | Year of establishment |
|---|---|---|
| Red Sea Thailand | Canned fish, canned fruits, canned vegetables, canned fruit juices, canned coconut products and rice | 2000 |
| Real Food and Beverage | Canned pineapple, canned tuna, sweet corn, beverages | 2017 |
| Kodanmal Co. Ltd | Canned tuna, canned sardines & mackerel, canned pineapple, canned corn, canned fruits, canned vegetables, fruits and vegetables, coconut product, tamarind, Thai rice, beverage | 1986 |

Source: Author based on the websites of the companies.

It can be argued that the rise and expansion of the trading companies are directly dependent on the strength of the domestic agro-processing industry including the tuna firms. As has been demonstrated in other GVCs (see Chapter 3), these firms can accumulate resources and capabilities to rise to become powerful players in GVCs, including controlling the entire value chain for its buyers. In some cases, trading companies can rise to become lead firms. This bodes well for Thailand since the size of the rents that accrue to the country will increase.

### b. Ghana

Since PFC, the most powerful tuna processor in Ghana, is a subsidiary of Thai Union, which owns its trading companies in key markets, the company's European brands are likely to be handled by Thai Union's subsidiaries in charge of marketing and distribution in Europe. However, the distribution of Star Kist to the local and regional market is undertaken by trading companies based in Ghana. For example, as at 2010, Star Kist's local distributor was Ghanaian-based Parry & Company (GNA news story published in Atuna, 2010). Cosmos Seafoods, which is more independent from its buyers, deals with international agents to connect with their buyers in Europe (TC1).

Whilst on my fieldwork in Ghana, I identified several trading companies that dealt in the importation and/or distribution in Ghana. However, I did not detect many trading companies taking advantage of the Ghanaian tuna industry to enter both local and foreign markets like the case in Thailand. This is unsurprising as the limited number of local products and brands

produced by the two canneries, the lack of a robust agro-processing industry (Owoo and Lambon-Quayefio, 2017) and the small size of the domestic market do not foster the rapid growth of these trading agents.

As I have mentioned already, trading companies can potentially grow to become first-tier suppliers, as demonstrated in several GVCs (see Chapter 3). This can increase the value Ghana or Thailand rakes from participation in tuna GVCs. Currently, Thailand is better placed in this regard since its trading companies serving the local, regional and other emerging markets can enhance their capabilities and accumulate resources, enabling them to acquire a tuna company in a developed country when the opportunity arrives.

### 8.3 Horizontal Linkages

#### a. Thailand

#### i. Related activities

Table 11 shows that most of the Thai firms do not process only tuna but have extended their facilities to manufacture other seafoods including mackerel and salmon. Some also produce canned fruits and vegetables. I indicated in the previous chapter that according to Corey (1990), tuna companies in Thailand fashioned their production facilities in a way that that they could quickly alternate among the manufacturing of different agro products depending on the availability of their raw materials. Aside that, there are those products which can be considered as by-products of tuna processing such as fishmeal (TC1). Table 11 shows that many Thai canneries produce petfood, which suggests that it can be classified as a by-product of tuna processing. Petfood is the most important product in Thai Union's pet-care and value-added division which together formed 15 percent of the company's sales in 2019 (Thai Union, 2020). Thai Union is also in the process of diversifying into tuna oil production with its cutting-edge refinery in Germany (Thai Union, 2020).

This suggests that the technological capabilities the firms accrue from the production of tuna can be applied to the manufacturing of other agro products especially as their production occurs within the same facility. For example, when the workers gain skills in safe production processes according to global standards such as the Hazard Analysis and Critical Control Point (HACCP)

and Good Manufacturing Practices (GMP), they can apply them to the manufacturing of tuna and other food products. On the websites of the various tuna manufacturers in Thailand examined for this study, they indicate that they can produce different food products according to these global standards. Also, Campling (2012) reports that the supermarkets (based in the developed countries) favour those suppliers that can provide them several products over those that offer just one (p. 165). This can encourage firms to pursue diversification of their products. Table 19 also shows that the trading companies deal in an expansive list of manufactured food products, and so I can infer that they are likely to prefer producers that can supply a wider range of products in order to reduce their transaction costs.

### ii. Non-related activities

My examination of the activities of the Thai firms shows that they are mostly linked to their related sectors. There are limited instances where some firms have expanded into sectors that can be denoted as unrelated to the tuna industry. For instance, Thai Union has made a number of investments in sectors such as e-commerce, printing and training services (Thai Union, 2020).

Linkages into the unrelated sectors can be promoted by the desire for Thai investors or entrepreneurs to increase their profitability. According to Simon (1996), the Thai entrepreneurs had a history of expanding into ventures in other manufacturing sectors. He argued that since most Thai businesses were family owned, they were able to mobilise resources to make these investments once the opportunity emerged. Following that, I argue that the tuna firms can be linked to unrelated ventures through the investments their entrepreneurs make. In other words, even if the skills and knowledge gained in tuna processing cannot directly lead to linkages into other sectors such as electronics, entrepreneurs can use their tuna companies to accumulate resources to fund their investments in those ventures. Simon (1996)'s description of the rise of the manufacturing sector in Thailand suggests that this is a strategy that has been widely used by entrepreneurs.

Thai Union for instance has created a venture fund of US $30 million that is aimed at investing in startups in food technology (Thai Union, 2019b). According to the company's website, "*the fund will focus on three strategic areas: alternative protein, functional nutrition and value*

*chain technology"* (Thai Union, 2019b). The company's head indicates on Thai Union's website that:

> *"As we move into the coming decade, we will increasingly cooperate with innovative start-ups in strategically interesting areas. This will complement our own activities as we are broadening our business beyond our traditional core"* (Thai Union, 2019b).

Apart from this, Thai Union has partnered with the National Innovation Agency and Mahidol University to establish the "*first global FoodTech startup incubator and accelerator*" in the country (Space F, 2019b). The areas which the incubator covers include "*packaging solutions, smart manufacturing, restaurant technology, food safety and quality, alternative proteins and health and wellness"* (Space F, 2019b). According to the list on the website of the incubator, the startups include firms from Thailand, other Asian countries and USA (Space F, 2019c, 2019a).

Strictly speaking, the areas Thai Union seeks to expand into can be described as related industries to tuna. However, this strategy of the company can be replicated to enter other areas that fall under the unrelated industries. More importantly, it shows how financial resources accumulated in one industry can propel the entry into other industries. This also highlights the importance of a strong financial sector to promote these linkages.

### b. Ghana

#### i. Related activities

Unlike the Thai firms, the Ghanaian tuna firms do not have a diverse range of products aside tuna. This is partly due to the lack of raw materials for other seafood production owing to the deteriorating state of Ghana's fisheries as discussed in Chapter 7. Apart from this, I argue that because the firms are subsidiaries of international firms, their parent companies control the extent of diversification the local firm can participate in. Thai Union for instance, can promote the manufacturing of petfood in its Ghanaian plant if they choose to do so but it does not appear

to be a priority for the parent company. As I noted in the previous chapter, Cosmos' main objective is maintaining or improving their position in the competitive tuna market (TC1), which does not make the issue of diversification an immediate objective.

In the same way I note that the Ghanaian tuna firms are isolated from other agro-processing firms in the country. According to Owoo and Lambon-Quayefio (2017), the agro-processing sector in Ghana is generally weak and food processing mainly takes the form of "*artisanal processing activities*" (p. 9). The integration of the country's agricultural and food processing sector is also fragile (Afful-Koomson et al., 2014; Owoo and Lambon-Quayefio, 2017). Therefore, since agro-processing in Ghana is dominated by small firms performing basic processing of raw materials (Owoo and Lambon-Quayefio, 2017), the kind of linkages observed in Thailand where agro-processing firms like fruits and vegetable processors diversified into tuna manufacturing (Hamilton et al., 2011, Kuldilok, 2009) is not prevalent in Ghana. This suggests that the tuna industry is alienated from other manufacturing industries and can be described as an enclave industry.

### ii. Non-related activities

I also do not find evidence of a connection between the tuna industries and the non-related industries. Whatever investments the local companies can make will depend on the strategies of their parent companies. This will in turn be influenced by the opportunities for diversification that the economy presents. As Simon (1996) recorded, the Thai entrepreneurs responded to opportunities that emerged in the economy and sought to diversify their operations, using vehicles such as joint ventures with foreign investors to promote such investments.

In Ghana's situation, the manufacturing sector is not sufficiently diverse, as, according to Nti (2015), out of the 33 manufacturing sectors under the International Standard Industrial Classification (ISIC) of the United Nations, only 16 are found in Ghana. He indicates that the most important manufacturing activities are "*food and beverages, paper and paper products, chemicals and chemical products, other non-metallic products and textiles"* (Nti, 2015, p. 5). This suggests that entrepreneurs or investors that seek to diversify have limited options and are likely to stay within the non-sophisticated manufacturing activities. In any case, since there are

no indigenous tuna processors, my argument that owning a tuna company provides financial resources to promote investments in firms in unrelated industries is undermined.

## 8.4 Conclusion

In this chapter, I have examined the types of linkages that form in the tuna industries of Thailand and Ghana. I have demonstrated that even though tuna fishing is not prominent in Thailand, in general, its domestic fisheries are connected extensively to domestic processing. In Ghana, the tuna industry is the star performer with regards to linkages between the fishing and processing sectors since the rest of the country's fisheries have suffered a steep decline.

Both Ghana and Thailand have not adequately exploited the possible linkages between tuna fishing and the boat making industry. I have indicated that fisheries potentially serve as a springboard for boat manufacturers to develop their capabilities to undertake manufacturing of more complex vessels. Many Thai boat makers are still stuck producing boats with materials like wood and fibre glass (Mocci, 2017). I argue that the challenges of upgrading in the ship-making industry suggests that the sectoral innovation system of the firms may not be strong. The situation is worse in Ghana where most boat makers have been replaced by wood carvers producing canoes for local fishermen (Connell, 2001).

Tuna processors may be linked to machine and packaging suppliers and this linkage has developed more in Thailand than in Ghana. However, the development of Thailand's machinery industry has been uneven and the process has been stimulated more by the private sector response to conducive conditions than a solid government programme to support the sector (Simon, 1996). In Ghana, this linkage between the tuna processors and the local machinery is non-existent. In addition, government effort to raise the capabilities of local metalworkers has been weak (NT4). Unfortunately, the private sector has not compensated for the lack of government action with investments in the industry.

In Thailand, the growth of the tuna and broader agro-processing industries has spurred the concomitant development of trading companies which connect Thai producers to local and foreign buyers, particularly in markets not dominated by the large tuna firms, like Africa, South America and the Middle East. These intermediaries can potentially rise to first-tier supplier or

even lead firm status. These dynamics are not pronounced in Ghana since the canneries mainly rely on foreign trading companies or agents although trading companies supplying to the local market exist.

I have argued that one advantage of the agro-processing industry is that the skills, knowledge and even machinery used in the manufacturing of one product can be applied to many other products which underscores the ability of the industry to expand. Thailand exemplifies this phenomenon. Ghana on the other hand seems to have a tuna industry isolated from other agro-processing industries.

Although tuna firms may struggle to extend their skills into more complex industries such as electronics, the entrepreneurs can use the tuna firm to accumulate financial resources to finance their investments into these complex industries. The large firms in Thailand such as Thai Union can make such undertakings as long as it is part of their strategy. The small size of the tuna processors in Ghana as well as the fact that they are only subsidiaries of international firms makes this type of linkage challenging.

# Chapter Nine

## Macro-Economic Setting for Structural Transformation

### 9.0 Introduction

In Chapter 1, I stated that this thesis study is motivated by my desire to understand the process of structural transformation of African economies. Although my empirical study is a sectoral analysis of the tuna industry, I find it useful to situate my observations within a larger developmental context. I carry out this exercise in this chapter, where I discuss the macro-environment within which Ghana's structural transformation drive is being undertaken. The purpose is to highlight some of the challenges the country faces in its quest to build a strong foundation for development. To provide a deeper context for my macro analysis, I first extend my analysis from the micro to the meso level of the economy by comparing the manufacturing sectors of Ghana and Thailand to verify if the arguments made about the tuna sector apply to the broader manufacturing sector.

For this purpose, I compare the level of sophistication of manufactured goods exports of Ghana and Thailand. A greater share of complex goods amongst a country's manufactured goods exports may be indicative of deeper technological capabilities possessed by manufacturing firms in the country. In addition, I use Fu et al.'s (2014) study, where they identify some of the sources of knowledge for manufacturing firms in Ghana, to comment on the larger sectoral innovation system of manufacturing firms in the country.

Following this, I extend my analysis to macro-level data of the Ghanaian economy to show some of constraints facing its progress in structural transformation and socio-economic development. Given the scope of this study, it is impractical to undertake a comprehensive examination of the structural transformation process of the entire Ghanaian economy. Rather, I illustrate, with reference to Nissanke (2019) (introduced in Chapter 2), how fragile macroeconomic environments and a poorly coordinated development policy framework have led to Ghana's limited progress in structural transformation. This provides a context for some of the observations I make in my empirical study of the tuna sector.

Using the five-point schema for pursuing structural transformation developed by Nissanke, (2019) as a guide, my discussions will focus on two main issues facing Ghana's structural transformation drive: 1) the mechanism of designing and coordinating national plans/policies; and 2) the issue of sustainable development financing. While my discussion here is very limited, leading potentially to an over-simplification of her more comprehensive framework, it serves as a precursor to a future research agenda (see chapter 10) that aims at understanding how sectoral innovation policies, underpinned by strong institutions and social capabilities, can be nested within a strong development strategy targeted towards achieving structural transformation.

The rest of the chapter is structured as follows: Section 9.1 deals with the examination of the technological capabilities of manufacturing firms. I first compare the strength of the manufacturing sectors of Ghana and Thailand by considering factors such as their contribution to value added of GDP and employment. I then analyse the level of complexity of manufacturing exports of Ghana and Thailand. This is indicative of the depth of the skills firms in Ghana and Thailand possess. Finally in this section, I use the findings of Fu et al (2014) to make inferences about the sectoral innovation system and hence the depth of the technological capabilities of manufacturing firms in Ghana.

In Section 9.2, I shift the analysis to the macro-level of the economy. As I have hinted earlier, my discussions are summarised into two main issues: the first concerns the design or formulation of policies or development programmes and the second deals with the matter of sustainable financing for development. These two issues are drawn out of Nissanke (2019)'s structural transformation model and although they cannot fully account for all the aspects of development in the economy, they give the reader an insight into the macro-environment that supports structural transformation. With regards to the mechanism of designing policies, I discuss the factors that affect the process by which policies are developed in Ghana. I demonstrate how the process impacts the coordination of the development policies as well as the institutional capacity of the country. On the issue of sustainable financing of development, I show how currently, Ghana's public finances as well as its macroeconomic policy objectives constrain its ability to support sustained public investments in the economy. I then look at issues relating to improving the mobilisation of local revenues.

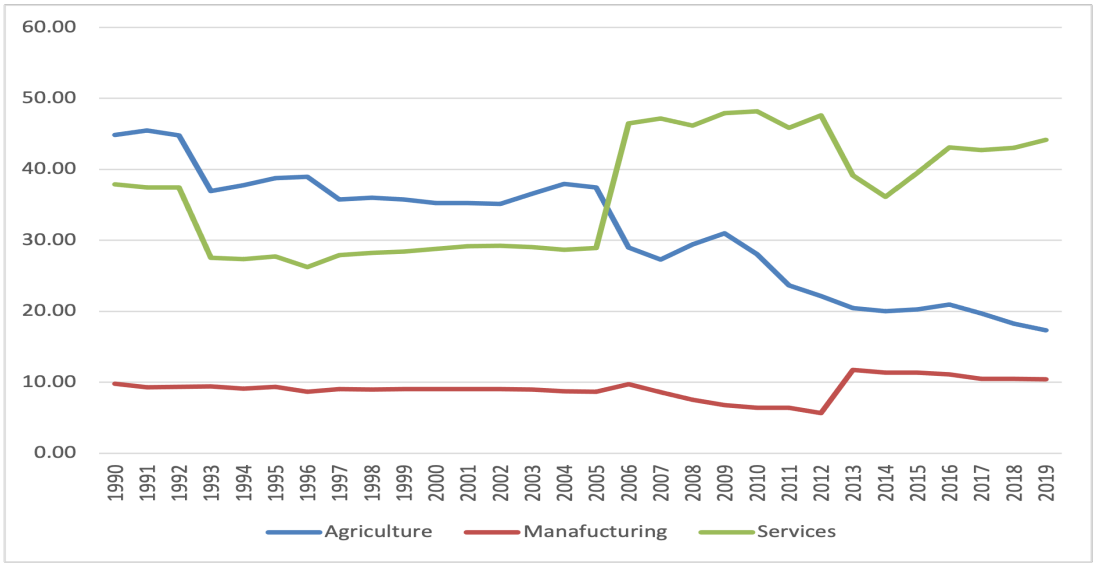
Section 9.3 presents my concluding remarks.

## 9.1 Assessing the Technological Capabilities of Manufacturing Firms

### a. Performance of the manufacturing sector

I begin this subsection by giving an overview of the performance of Ghana's manufacturing sector. Figure 22 shows the contribution to value added by the various sectors of Ghana's economy. The data shows that Ghana's manufacturing sector has consistently stayed as the weakest sector in terms of contribution to value added. The graph shows that value added in manufacturing has largely remained stable since the 1990s, only experiencing some increase after 2012. The average contribution of manufacturing up until 2013 was almost 9 percent but moved to about 11 percent after that. The contribution of agriculture, which was the most dominant sector at the beginning of the 1990s declined steadily overtime and was overtaken by services in 2006.

Figure 22 Ghana Share of Value Added by Sectors (Per cent of GDP)



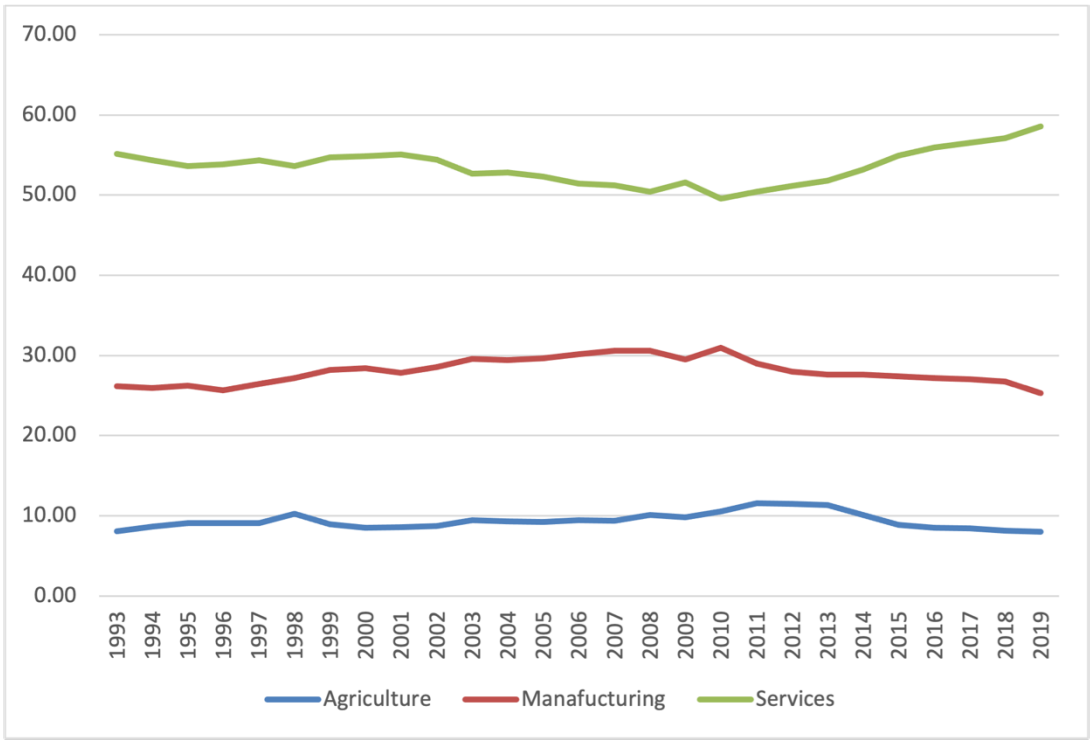

Source: Author's illustration using data from World Bank (2021)

The services sector's impressive growth particularly since 2006 has been spurred by more skill-intensive sectors such as telecommunications and financial services (Ghana Statistical Service, 2015; Shand 2019). For instance, according to the national accounts published by the Ghana

Statistical Service in 2015, information and communication grew at almost 25 percent in 2010 and about 42 percent in 2012 (Ghana Statistical Service, 2015 p. 7).

In the case of Thailand, Figure 23 shows that the relative positions of the various sectors in Thailand have not changed since the 1990s even though services experienced a decline until after 2010 when it started increasing its share of the economy. At the same time, manufacturing's contribution was improving until its decline after 2011. The data shows that manufacturing in Thailand contributes almost three times that of Ghana to total value added in the economy.

Figure 23 Thailand Share of Value Added by Sectors (Per cent of GDP)



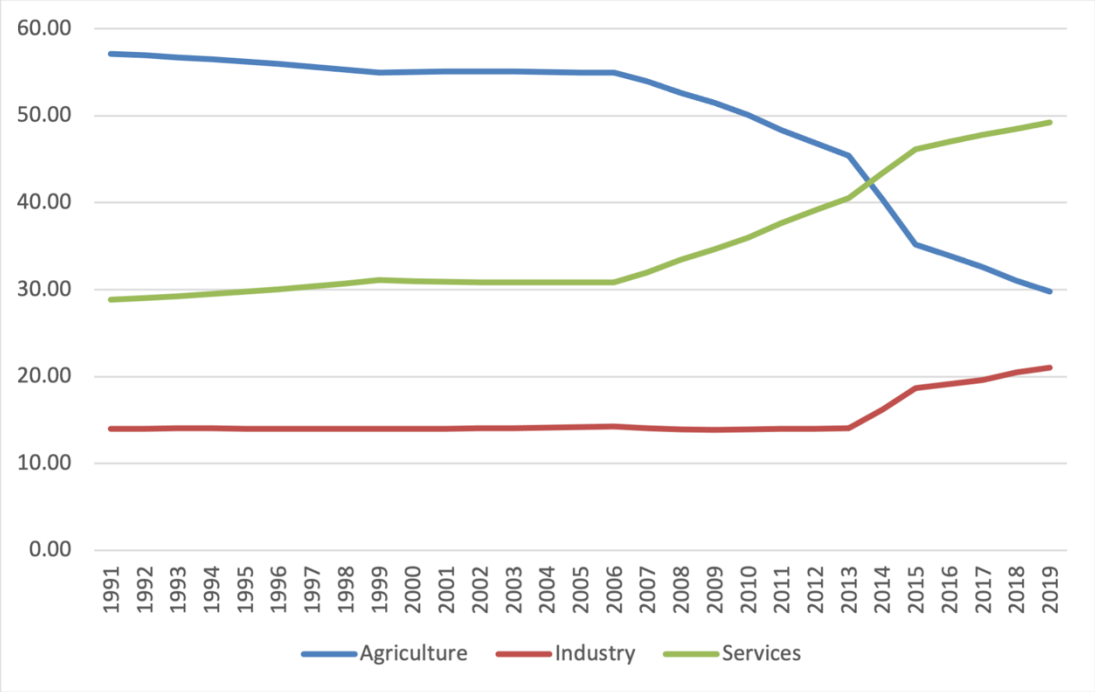

Source: Author's illustration using data from World Bank (2021)

In terms of the share of employment of each sector in Ghana, industry, which includes mining, lags behind services and agriculture. [59] Although agriculture's share was declining from the 1990s, it remained the largest employer until 2014 when it was overtaken by services (see Figure 24 below). Figure 24 shows how the services sector dramatically improved its share of employment after 2006. Currently, it accounts for almost 50 percent of total employment.

[59] The World Bank provides data on employment for industry instead of just manufacturing alone. In addition, the data on employment in this section is based on ILO estimates according to the World Bank.

The fall in agriculture's share and the improvement in that of industry and services may suggest at first glance that some underlying economic transformation is taking place. However, this is a problematic conclusion considering that according to Ghana Statistical Service (2016), about 90 percent of Ghanaian workers are in the informal sector.[60] Of this number, the agricultural sector accounts for 35 percent whilst service/sales takes 28 percent of the informal workers (Ghana Statistical Service, 2016). This suggests that despite the improvement in value added in the service sector, driven by communications and financial services (Ghana Statistical Service, 2015), it has had a dismal effect on employment as many workers are still located in the informal economy.

Figure 24 Ghana Share of Employment by Sector



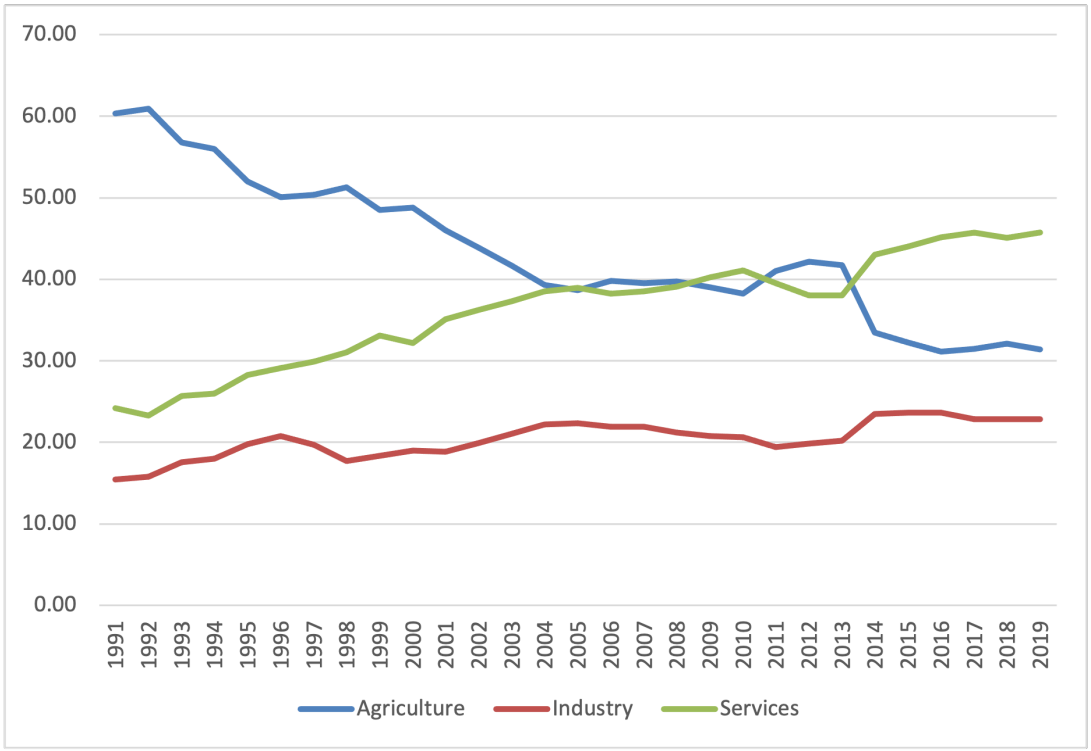

Source: Author's illustration using data from World Bank (2021)

The story in Thailand, as depicted in Figure 25, is like that of Ghana's. Industry's share of employment is the weakest whilst agriculture's dominance from the 1990s has been ended by services, which is now the leading sector in terms of employment. Agriculture's share has however remained over 30 percent even though from Figure 23, value added from the sector

[60] The workers are those of age 15 and above (Ghana Statistical Service, 2016).

has mainly been below 10 percent. This suggests that productivity of workers in agriculture is low.

Figure 25 Thailand Share of Employment by Sector




Source: Author's illustration using data from World Bank (2021)

I now turn to assess the depth of the technological capabilities of manufacturing firms in the two countries.

### b. Complexity of manufacturing products

Table 20 provides information on the manufactured exports of Ghana including medium and high technology exports. [61] The table also contains data on ICT goods exports which can be used to represent electronics goods based on the World Bank definition for the measure.[62]

[61] According to the World Bank; "*high-technology exports are products with high R & D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments and electrical machinery*" (World Bank, 2021).
[62] The World Bank defines the ICT goods as "*computers and peripheral equipment, communication equipment, consumer electronic equipment, electronic components and other information and technology goods*" (World Bank, 2021).

Manufacturing exports as a proportion of merchandise exports in Ghana have generally been low, averaging about 10 percent since 2000. Indeed, in 2018, the share of the sector fell to its lowest (3.52 percent) since the 2000s according to available data in Table 20. The share of medium and high-technology products has tended to fluctuate. In terms of high-technology exports alone, available data since 2010 indicates that their share has mostly stayed under 10 percent although the numbers tend to fluctuate sharply, rising to about 7 percent in one year for instance and sharply dropping to 2 percent in the next year as was the case in 2015 and 2016.

The data on ICT goods clearly shows Ghana's weakness in the electronics industry, which is indicative of lower technological capabilities. Since 2000, the share of ICT goods exports has stayed below 1 percent and have almost hit 0 percent on several occasions.

Table 20 Ghana Exports of Complex Products[63]

| Year | Manufactures exports (% of merchandise exports) | Medium and high-tech exports (% manufactured exports) | High-technology exports (% of manufactured exports) | ICT goods exports (% of total goods exports) |
|---|---|---|---|---|
| 2000 | 9.26 | 6.46 | .. | 0.14 |
| 2001 | 10.82 | 5.53 | .. | 0.03 |
| 2002 | .. | 5.53 | .. | .. |
| 2003 | 4.59 | 7.59 | .. | 0.01 |
| 2004 | 8.09 | 12.92 | .. | .. |
| 2005 | 23.35 | 8.11 | .. | 0.02 |
| 2006 | 21.24 | 2.86 | .. | 0.00 |
| 2007 | 12.48 | 13.37 | .. | 0.02 |
| 2008 | 10.25 | 18.10 | .. | 0.04 |
| 2009 | 10.34 | 20.08 | .. | 0.03 |
| 2010 | 7.28 | 24.99 | 2.43 | 0.02 |
| 2011 | 7.70 | 5.93 | 1.70 | 0.05 |
| 2012 | 6.22 | 19.98 | 7.78 | 0.06 |
| 2013 | 9.64 | 33.27 | 5.12 | 0.19 |
| 2014 | 9.18 | 33.27 | 10.12 | .. |
| 2015 | 8.57 | 15.85 | 7.59 | .. |
| 2016 | 8.60 | 15.85 | 2.30 | 0.09 |

[63] Spaces with three dots (…) imply unavailable data.

| | | | | |
|---|---|---|---|---|
| 2017 | 6.48 | 18.59 | 4.47 | 0.02 |
| 2018 | 3.52 | 15.20 | 8.30 | 0.26 |
| 2019 | 5.20 | .. | 1.14 | .. |

Source: World Bank (2021)[64]

Table 21 shows that Thailand's manufacturing exports account for a higher portion of its merchandise exports (over 70 percent) compared to Ghana. More than half of these manufactured exports are medium and high technology products. High technology products alone make up over 20 percent of the manufactured exports. In terms of the share of goods exports that are ICT products, it has been falling since 2000, from almost 30 percent to about half its value by 2018. This is still significantly higher than that of Ghana's. The observation corroborates my revelations in the tuna industry that Thai firms possess more enhanced technological capabilities than their Ghanaian counterparts.

Table 21 Thailand Exports of Complex Products

| Year | Manufactures exports (% of merchandise exports) | Medium and high-tech exports (% manufactured exports) | High-technology exports (% of manufactured exports) | ICT goods exports (% of total goods exports) |
|---|---|---|---|---|
| 2000 | 75.07 | 59.60 | .. | 28.69 |
| 2001 | 74.14 | 58.40 | .. | 26.11 |
| 2002 | 74.56 | 59.22 | .. | 25.89 |
| 2003 | 74.81 | 60.90 | .. | 25.28 |
| 2004 | 75.80 | 61.46 | .. | 23.79 |
| 2005 | 76.59 | 61.88 | .. | 23.43 |
| 2006 | 75.31 | 62.36 | .. | 23.74 |
| 2007 | 75.82 | 62.54 | 27.90 | 21.64 |
| 2008 | 72.33 | 60.42 | 26.34 | 19.06 |
| 2009 | 71.74 | 59.56 | 27.51 | 19.78 |
| 2010 | 72.46 | 61.82 | 26.29 | 18.93 |
| 2011 | 69.60 | 58.53 | 22.71 | 15.57 |
| 2012 | 70.95 | 59.63 | 22.84 | 16.04 |
| 2013 | 73.33 | 59.83 | 22.14 | 15.59 |
| 2014 | 74.70 | 60.87 | 22.69 | 16.03 |
| 2015 | 75.84 | 62.66 | 23.95 | 16.61 |

[64] Medium and high-tech export shares for 2013 and 2014 as well as 2015 and 2016 are the same. This may be due to mis-reporting by the source data.

| | | | | |
|---|---|---|---|---|
| 2016 | 75.16 | 63.81 | 24.19 | 15.76 |
| 2017 | 74.08 | 63.15 | 25.12 | 16.11 |
| 2018 | 74.86 | 62.21 | 23.72 | 15.59 |
| 2019 | 72.98 | .. | 23.61 | .. |

Source: World Bank (2021)

### c. Sources of knowledge for manufacturing firms in Ghana

As I have indicated earlier, I rely on Fu et al. (2014), who conduct an extensive study on innovation by manufacturing firms in Ghana, for my analysis in this subsection.[65] The relevance of their work for this study is that they provide information on the different sources of knowledge for the firms, which allows me to integrate their empirical observations into my study.[66]

Fu et al. (2014) make a distinction between formal and informal firms with the latter being those "*that may avoid taxation or other mandated regulation because law enforcement is weak and uneven*" (p. 7) as they believe that the process of innovation in both types of firms may differ.[67] For instance, they indicate that it is the formal firms that are usually able to employ highly skilled personnel and establish relationships with foreign buyers and suppliers.

I mentioned in Chapter 8 that in a weak innovation system, the firm bears a greater burden of generating its own knowledge to develop its capabilities. In Fu et al. (2014), they make a similar observation although they identify multiple ways this is done. First, they detect that a small proportion of firms, about 3 percent, pursue R&D. Second, they realise that skilled workers develop new ideas after encountering challenges (which corresponds to Arrow's (1962) learning-by-doing' concept) (Fu et al., 2014). This takes place in almost 26 percent of the firms, although formal firms, by virtue of their greater recruitment of skilled workers, are more reliant on this method (35 percent) compared to informal firms (19 percent) (Fu et al., 2014). Third,

[65] Some of firms in their sample included those engaged in production of food, beverages, textiles, paper, chemicals, electrical equipment and machinery and equipment. The full list of the category of firms is provided in Table A.3 of the appendix of their study.
[66] Their study does not use the innovation systems approach. It also does not incorporate technological capabilities.
[67] The authors define innovation in their study as "*the creation or adoption to a new product or process, and new organizational and marketing practices, where 'new' means new to the world or new to the country or the firm*" (Fu et al., 2014, p. 4).

some firms undertake some form of learning-by-doing (á la Arrow (1962)) by simply altering products of other companies (Fu et al., 2014).

The authors also mention that the manufacturing firms, both formal (69 percent) and informal (54 percent), are dependent on their buyers for knowledge. Although the authors do not situate their analysis within a GVC framework, it can be suggested that the interactive nature of the exchange between the firms and their buyers is akin to the type that occurs in relational governance structures. In Chapter 7, I hinted about the importance of buyers for the transfer of knowledge to tuna firms in Ghana although such engagements were stronger in hierarchical chains than modular ones.

Fu et al. (2014) also suggest that Ghanaian manufacturing firms rely extensively on other firms for technological knowledge. The authors observe that the firms gain knowledge from their competitors or even from those not involved in the industry. They do so by attracting workers from their rivals or relying on the diffusion of information in a cluster (Fu et al., 2014). According to the authors however, it is the informal firms that tend to depend more on information flow within the cluster. This observation supports my finding that in Thailand, the tuna cluster had become an important avenue for the transfer of knowledge particularly for small tuna firms.

The firms' suppliers also serve as a source of knowledge for innovation (Fu et al., 2014). The formal firms, who tend to have greater resources, are able to forge connections with major local and foreign machine and equipment suppliers (Fu et al. 2014). Interestingly, the internet was identified by the authors as a relatively important knowledge source for the firms. The authors also find evidence of both formal and informal firms contacting institutions including universities and other research centres. However, they insist that instead of broad cooperation or partnership agreements between the firms and the institutions, such engagements usually involve personal communications between individuals at the firm and those at the universities. Fu et al. (2014) assert that such interactions are fragile as they are dependent on the continued access of the individuals at the firm to their contacts at the university.

Fu et al.'s (2014) study suggests that the sectoral innovation system for manufacturing firms in Ghana is quite broad in terms of the number of agents. They group the local agents that transmit knowledge to the firms into the following five categories – internal sources (firm's own

efforts), network (cluster), market resources (suppliers, buyers, other firms), institutional sources (universities, research organisations) and other sources (radio, internet, associations, conferences) (see p. 16 of their text for full breakdown of the sources). When considering the individual elements of the categories, the most important sources of knowledge to the firms are their buyers, the internet and skilled workers in the firms (Fu et al., 2014).

Their study is relevant because it gives a general insight into the sectoral innovation system of manufacturing firms in Ghana although it is difficult to examine the strength of their capabilities from merely identifying the sources of knowledge to firms.

## 9.2 Macro-level Analysis of Development

### a. Mechanism of designing national development plans/policies

According to Nissanke (2019), developing countries must focus their public investments towards transforming their "*revealed comparative advantage*" (p. 108). Such investments must however be anchored within a proper national development strategic plan that must have a long-term perspective (Nissanke, 2019). Additionally, the economy must be freed of constraints which inhibit its expansion so as to "*build an articulated economy with dynamic externalities and spillovers on the basis of scale economies required for high-value added activities*" (Nissanke, 2019, p. 109). These measures she mentions must be represented in policies and programmes for implementation. Whilst I do not examine specific policies or programme in this section, I look at the general framework under which policies and national plans are designed and coordinated in Ghana.

In Ghana, the elected political authority (government) sets out its development agenda for the country at the beginning of its term (National Development Planning Commission, n.d), as evidenced by the current programme which is dubbed: "The Coordinated Programme of Economic and Social Development Policies 2017 – 2014" (Government of Ghana, 2017). Under the status quo, although the country's development planning agency influences the development of economic programmes, it is the government that is mainly in control of the process (National Development Planning Commission, n.d). This also implies that the development focus of the country is strongly tied to the life of any government and can quickly

change once a new government is elected. This potentially violates one of the cardinal pillars of development – pursuing a long term development plan – according to Nissanke (2019).

In a competitive democracy such as Ghana's, political parties often try to differentiate themselves by pitching different ideas to electorates without recourse to existing policies and how they align to their propositions. This also means that there is a higher propensity for political parties to proffer populist ideas which may quickly win votes even if its implementation and objectives are not in line with the country's overall development goals. In any case, once they are in power and are faced with financial constraints, they are motivated to discontinue existing policies to switch resources towards accomplishing campaign promises. Braimah et al. (2014) give an account of how educational reforms in Ghana have been subjected to regular changes depending on who has power. The most dramatic example in recent times was when as part of reforms, the duration of senior high school education was extended from three to four years by the New Patriotic Party (NPP) government in 2007, only for this measure to be reversed by the National Democratic Congress (NDC) government in 2010 after coming into power in 2008 (Braimah et al., 2014).

In effect, Ghana's current practice, ostensibly designed to prevent successive governments from being locked into long term plans drawn up today, potentially creates a situation where there is a lack of clear policy direction. This situation affects the coordination of policies and the institutional capacity of the country. I consider these factors next.

***Coordination of Policies***

Nissanke's model emphasizes the importance of harmonising not only the different development policies of a country but also development and macroeconomic policies. Based on the discourse so far, the weak linkages or lack of continuity of policies of successive governments undermine their coordination in Ghana. Additionally, according to Ofei-Aboagye (2018), changes in government often induce wholesale changes in personnel at the helm of the implementation of policies, which potentially affect the smooth continuation any policy.

In addition, because some of the development policies originate from campaign promises (Braimah et al., 2014) which may not be anchored in a long term development plan, it is likely

that policies are pursued separately with little connection amongst them. Zakari and Boly (2013) opine that in developing its industrial policy in 2011, the representatives from different ministries/sectors were brought together in the design process. Whilst this is a potential tool for mitigating against the coordination problem of policies, they may not be sufficient considering the challenges I have mentioned so far.

***Institutional capacity***

I use the term *"institutional capacity"* here to refer to the country's ability to plan, implement and monitor its development policies. This covers not only the policy makers at the helm of designing and supervising policies but also the human resource in the country who are also central to the successful implementation of a policy. Thus, the institutional capacity embodies the technical, administrative and even political expertise available to Ghana in its development drive. Measuring the quality of this institutional capacity can be challenging. For this study, I will use the strength of Ghana's education system as an indication of the depth of its institutional capacity. This is however not sufficient as it does not fully account for other factors such as experiences gained on the job.

By many indications, Ghana has a relatively robust educational system particularly when compared to its African peers (Kamran et al., 2019). For instance, the literacy rate in Ghana, as at 2018, was almost 80 percent compared to about 65 percent for sub-Saharan Africa (World Bank, 2021). In Table 22 below, at the beginning of the 2000s, the percentage of children that were not in school in Ghana was close to that of sub-Saharan Africa. However, by 2011, Ghana's rate had fallen to more than half of that of sub-Saharan Africa. In 2019, the percentage of children that were not in school was less than 1 percent compared to almost 19 percent in sub-Saharan Africa.

Table 22 Children not in School (Per cent of Primary School Age)

| Year | Ghana | Sub-Saharan Africa |
|---|---|---|
| 1999 | 40.20 | 41.30 |
| 2000 | 32.08 | 38.99 |
| 2001 | 37.52 | 36.88 |
| 2002 | 33.51 | 35.13 |
| 2003 | 34.17 | 32.55 |

| | | |
|---|---|---|
| 2004 | .. | 30.63 |
| 2005 | 29.39 | 28.37 |
| 2006 | 27.27 | 26.48 |
| 2007 | 21.97 | 23.85 |
| 2008 | 16.37 | 22.86 |
| 2009 | 15.90 | 22.18 |
| 2010 | .. | 22.49 |
| 2011 | 7.97 | 21.21 |
| 2012 | 8.78 | 20.83 |
| 2013 | .. | 20.07 |
| 2014 | .. | 19.74 |
| 2015 | .. | 19.82 |
| 2016 | .. | 19.38 |
| 2017 | 2.18 | 19.09 |
| 2018 | 3.62 | 19.16 |
| 2019 | 0.82 | 18.66 |

Source: World Bank (2021)

This suggests that Ghana has been investing significantly to promote access to education for its children. Table 23 below shows that investments in education in Ghana since 2000 has usually been higher, in some years, even double that of the continent. However, in more recent years (since 2017), Ghana's share of GDP that goes into education has fallen below that of sub-Saharan Africa.

Table 23 Public Spending on Education (Per cent of GDP)

| Year | Ghana | Sub-Saharan Africa |
|---|---|---|
| 1999 | 4.11 | 3.32 |
| 2000 | .. | 2.81 |
| 2001 | 5.35 | 3.43 |
| 2002 | .. | 3.06 |
| 2003 | .. | .. |
| 2004 | 7.54 | 3.11 |
| 2005 | 7.42 | 3.52 |
| 2006 | 5.26 | 3.57 |
| 2007 | 5.52 | .. |
| 2008 | 5.76 | 3.29 |
| 2009 | 5.32 | 3.61 |

| | | |
|---|---|---|
| 2010 | 5.54 | 3.54 |
| 2011 | 8.14 | 3.22 |
| 2012 | 7.92 | 3.45 |
| 2013 | 4.61 | 3.33 |
| 2014 | 4.49 | 4.04 |
| 2015 | 4.51 | 4.15 |
| 2016 | 4.49 | 3.26 |
| 2017 | 3.62 | 4.03 |
| 2018 | 3.99 | 4.30 |

Source: World Bank (2021)

Another indicator which demonstrates the relative position of Ghana's educational system is the number of students that pursue tertiary education, as shown in Table 24 below. At the beginning of the 1990s, the percentage of the population old enough to be in tertiary institutions that were enrolled was less than 1 percent. This was considerably lower than the 3 percent of sub-Saharan Africa. Even though Ghana's figure rose over time, it still stayed below that of the continent until 2008. Since then, this figure has risen sharply and by 2018, it was almost double its 2008 figure. More importantly, it is now significantly higher than the sub-Saharan Africa number. However, as the table shows, when compared with upper middle-income countries like Thailand (World Bank, 2011), Ghana's education system is lagging. Table 24 for instance shows that in Thailand, almost half of the population that is of tertiary education age group are enrolled in the institutions.

Table 24 Gross Tertiary Enrolment (Per cent of Tertiary Education Age Group)

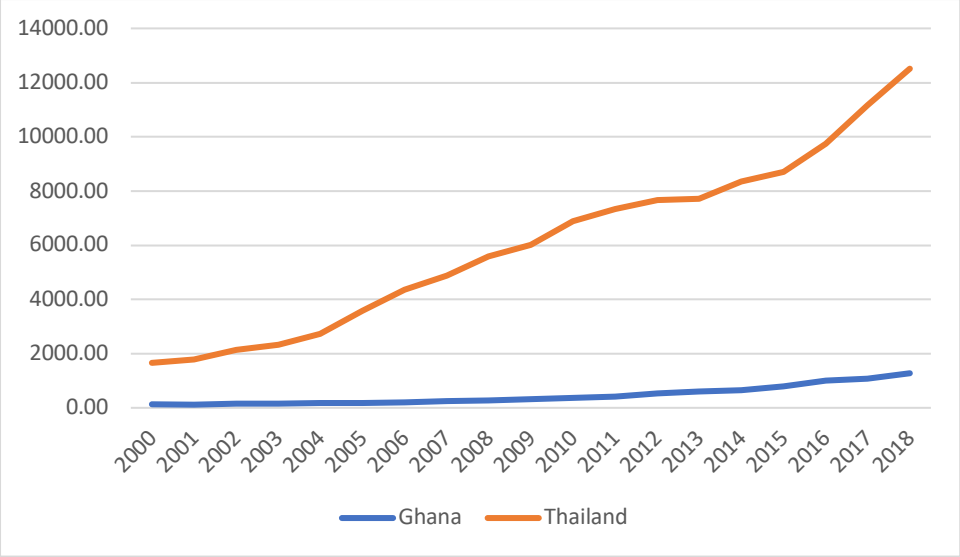
| Year | Ghana | sub-Sahara Africa | Thailand |
|---|---|---|---|
| 1990 | … | 3.22 | 15.86 |
| 1991 | 0.92 | 3.32 | .. |
| 1992 | 1.06 | 3.42 | .. |
| 1993 | 1.26 | 3.61 | 19.20 |
| 1994 | 1.28 | 3.76 | .. |
| 1995 | .. | 3.84 | 19.84 |
| 1996 | .. | 3.92 | 20.49 |
| 1997 | .. | 4.00 | 22.85 |
| 1998 | .. | 4.07 | 26.71 |
| 1999 | .. | 4.16 | 32.59 |
| 2000 | .. | 4.53 | 34.88 |

| | | | |
|---|---|---|---|
| 2001 | .. | 4.91 | 39.07 |
| 2002 | .. | 5.26 | 40.00 |
| 2003 | .. | 5.64 | 40.95 |
| 2004 | .. | 5.88 | 42.07 |
| 2005 | 5.87 | 6.20 | 44.58 |
| 2006 | 5.24 | 6.40 | 44.86 |
| 2007 | 6.44 | 6.60 | 49.03 |
| 2008 | 8.48 | 6.96 | 48.67 |
| 2009 | 8.80 | 7.39 | 49.40 |
| 2010 | .. | 7.88 | 50.37 |
| 2011 | 11.77 | 8.24 | 52.26 |
| 2012 | 11.94 | 8.56 | 50.68 |
| 2013 | 13.83 | 8.90 | 49.85 |
| 2014 | 15.40 | 9.04 | 50.18 |
| 2015 | 15.69 | 9.17 | .. |
| 2016 | 15.54 | 9.20 | 49.29 |
| 2017 | 16.01 | 9.31 | .. |
| 2018 | 15.69 | 9.44 | .. |

Source: World Bank (2021)

Again, in Figure 26 below, the number of scientific and technical journal articles produced by Ghana since 2000 have grown slowly but that of Thailand has seen an exponential surge during the same period. This is not surprising given that from Table 24, a greater percentage of the Thai population of tertiary education age group make it to those institutions when compared to Ghana.

Figure 26 Scientific and Technical Journals Production




Source: Author's illustration using data from World Bank (2021)

According to UNCTAD (2011), who conducted an extensive examination of Ghana's science, technology and innovation eco-system, the high number of universities, public research centres, government agencies and supportive policies in Ghana have not significantly affected innovation in the country. Among the reasons they assign to this situation are the low investments in research in the schools and the limited linkages between industry and academia.

The authors suggest that although the government is a major sponsor of research in Ghana, it does not appear to have it as a main priority, as its budgetary allocation towards R&D tends to be less than 1 percent of GDP. Indeed, it was only in 2020 that Ghana's parliament considered the National Research Fund Bill which mandates the government to set aside 1 percent of GDP or more for research (Ghanaweb, 2020). UNCTAD (2011) also argue that even the country's research institutions like universities end up devoting a huge chunk of their resources to meet their current expenditure rather than support research.

Ghana faces a shortage of highly skilled workers since the universities are not training enough (UNCTAD, 2011. p. 4). This problem was highlighted by Zakari and Boly (2013) who analysed the policymaking process of Ghana's industrial policy in 2011. They observed that there were insufficient personnel within the government and the larger society with the requisite expertise to assist in the process. The authors add that although foreign consultants could fill the gap, they tended to be very costly. Ofei-Aboagye (2018) also notes this problem of inadequate expertise in relation to the implementation of industrial policies in Ghana.

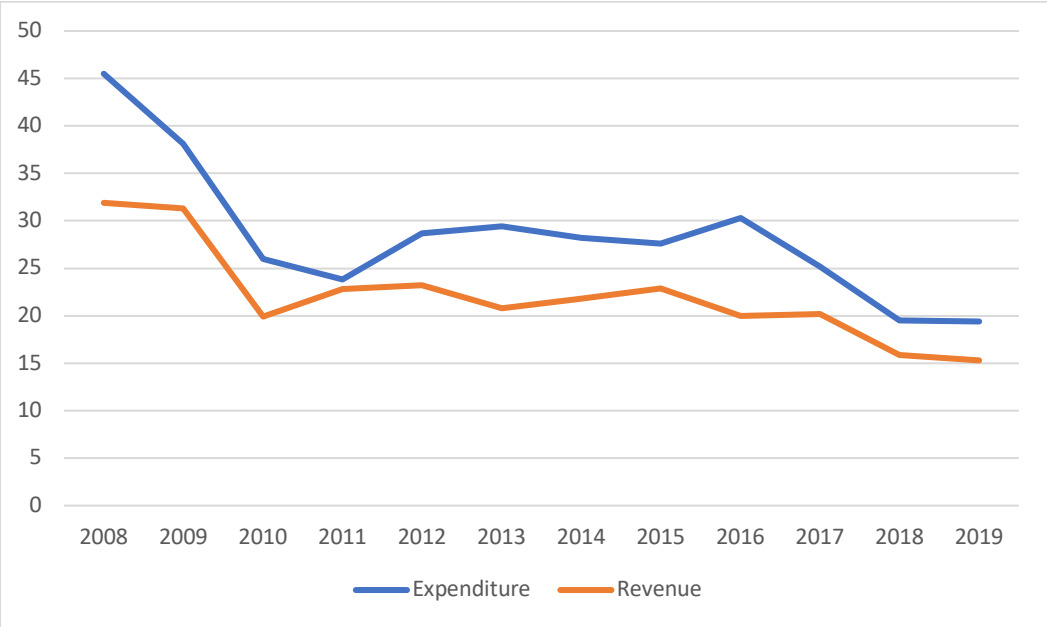
### b. Sustainable financing of development

***Challenges with current financing schemes***

Following the prevailing wisdom, Ghana has been adopting macroeconomic policies with the sole purpose of achieving price stability, as evidenced by the central bank's inflation targeting framework where the current "*target is 8% with a symmetric band of 2%*" (Bank of Ghana, n.d), whilst the government seeks to pursue fiscal policies to accompany this price stabilisation objective by capping the annual fiscal deficit to 5% (Geiger and Arthur, 2019). Yet, despite the stated objective, Ghana has been experiencing frequent macroeconomic instability induced by the pro-cyclical nature of its fiscal policies; a situation that is accentuated during commodity price hikes or election years (Bawumia et al., 2017; Geiger and Arthur, 2019).

Assessed in light of Nissanke (2019)'s propositions, this price stabilisation agenda indicates that Ghana's macroeconomic policies do not have a developmental perspective. To verify this, I examine some fiscal data of Ghana to see whether it can pursue an aggressive programme of investments in the economy as envisaged by Nissanke.

Figure 27 Ghana Revenue and Expenditure (Per cent of GDP)

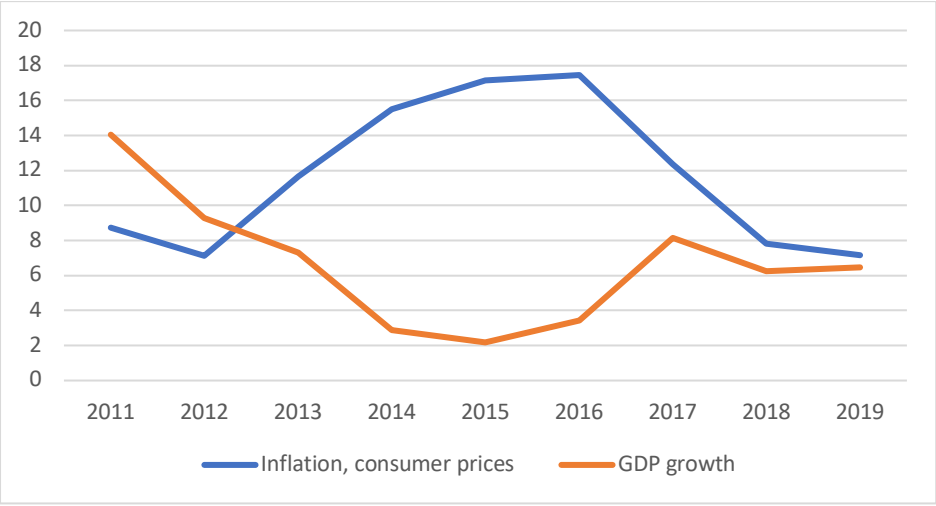



Source: Ministry of Finance and Economic Planning (2020)

2008 was an election year and as Figure 27 above shows, the fiscal deficit in that year was significantly high (almost 14 percent) due to high expenditures hitting more than 45 percent of GDP (Ministry of Finance and Economic Planning, 2020). The fiscal deficit began to tighten thereafter and by 2011, when oil revenues started streaming in (Bawumia et al., 2017)), it was only at 1 percent as shown in Figure 27. However, according to Bawumia et al (2017, p. 6), the oil revenues stimulated an appetite for spending and "*gave a false sense of greater fiscal space than was the case*" (p. 6).

Figure 28 also depicts how despite the sharp surge in expenditure since 2011, total revenue has not increased in commensuration leading to further widening of the deficit. In 2016, an election year, the fiscal deficit was over 10 percent, the highest since 2008 (Ministry of Finance and Economic Planning, 2020). Furthermore, the increased expenditure has not necessarily led to greater expansion of the economy, raising questions over its developmental impact. In Figure 28 below, since Ghana recorded GDP growth of 14 percent in 2011 owing to oil revenues coming on board, the growth rate has declined steadily, hitting just 2 percent in 2015. While growth has however recovered since, inflation has risen sharply over the same period peaking at almost 17.5 percent in 2016 before declining as shown in Figure 28.

Figure 28 GDP and Inflation Growth Rate



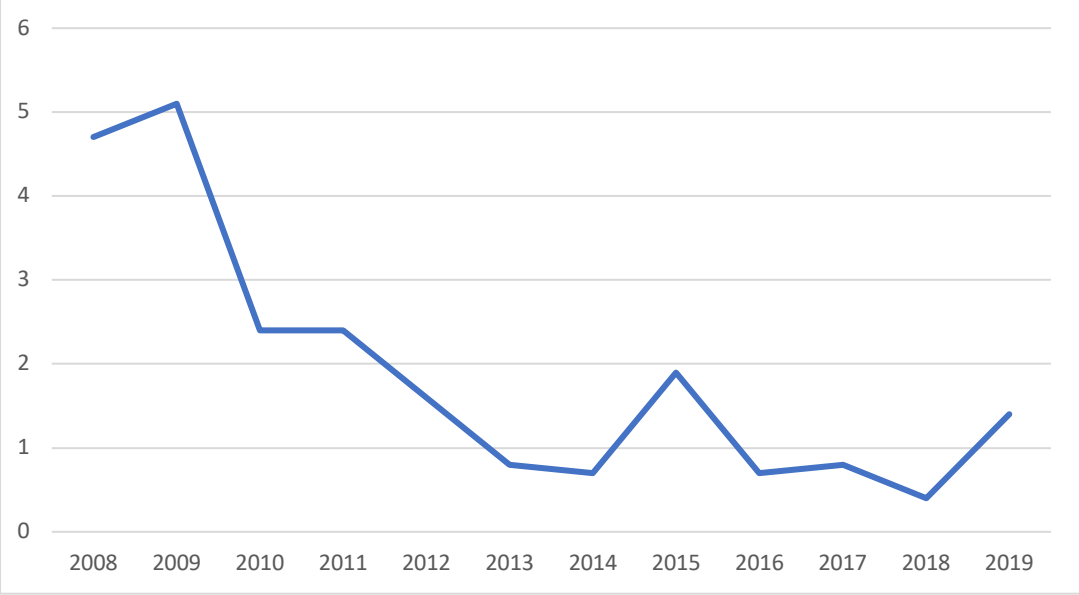

Source: World Bank (2021)

The decline in the growth from 2012 to 2015 explains the poor performance of total revenues. Observers such as Bawumia et al. (2017) mainly attribute the macroeconomic instability to

recklessness on the part of policy makers who have an unrestrained enthusiasm for spending. However, in my view, such assertions do not account for the fundamental problem: which is, how can developing countries pursue development through sustained public investments without compromising their macroeconomic stability? As I demonstrate shortly, in addition to the sluggish progress in efforts to boost local revenues, Ghana's situation has been aggravated by the fact that more stable external sources of revenues such as grants and concessional loans have shrunk and been overtaken by costly and less secure sources.

This development was as a result of the country reaching low-middle income status in 2010, which disqualified it from being a recipient of concessional loans aimed for low income countries by the World Bank (Moss and Majerowicz, 2012) and led to a shrinking in grants (Kumi, 2019). As Figure 29 below indicates, total grants to Ghana fell sharply after 2009 when it was above 5 percent of GDP to 2.4 percent in 2010. By 2018, it was just about 0.4 percent (Ministry of Finance and Economic Planning, 2020).

Figure 29 Foreign Grants to Ghana (Per cent of GDP)

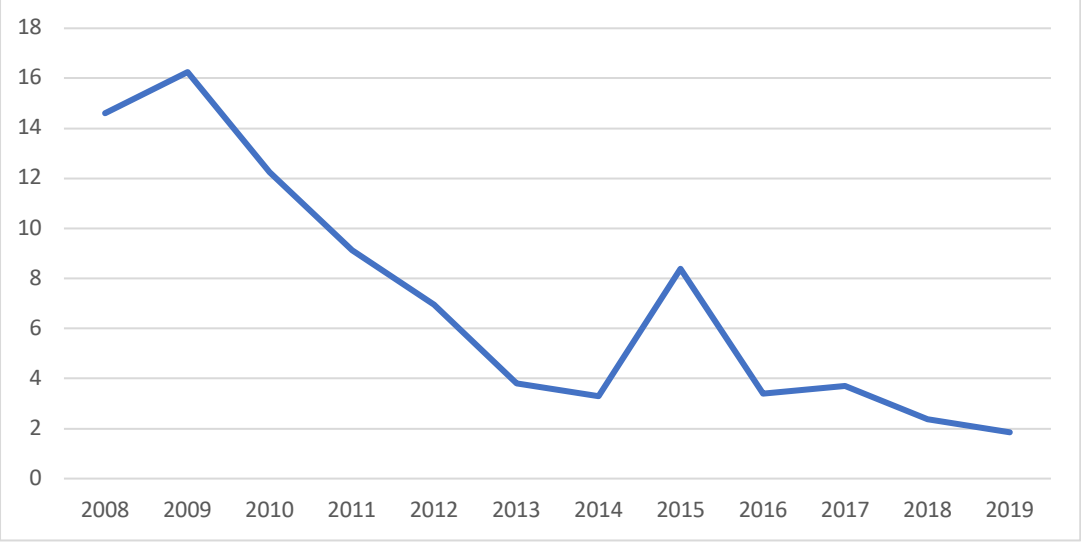



Source: Author's illustration using data from Ministry of Finance and Economic Planning (2020)

Figure 30 shows the grants to Ghana as a percentage of total revenue. As at 2009, which was prior to Ghana's designation as a low-middle income country and the onset of oil revenues, grants accounted for about 16 percent of total revenues in the economy. The proportion of

grants have however fallen dramatically since then and by 2019, it accounted for less than 2 percent of total revenues as shown in Figure 30.

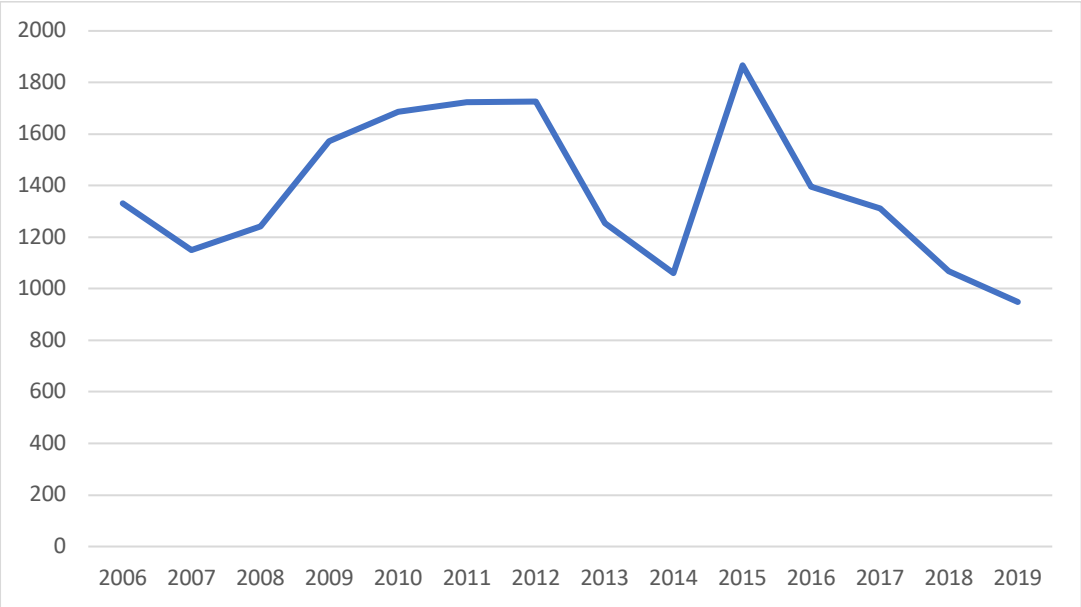
Figure 30 Foreign Grants to Ghana (Per cent of Government Revenue)




Source: Author's illustration using data from Ministry of Finance and Economic Planning (2020)

In addition, the graph in Figure 31 below shows how net official development assistance experienced a sharp drop after 2012 and even though it spiked in 2015, it has been declining since then.

Figure 31 Net Official Development Assistance to Ghana (constant 2018 $million)




Source: World Bank (2021)

As grants have fallen in importance to the country's revenues, Ghana has had to lean more on borrowing to finance its increasing deficit. Table 25 below shows the type of lenders in Ghana's debt portfolio. Commercial loans dominate the country's loans, accounting for almost 50 percent of Ghana's loans in 2019 (see Table 25 below).

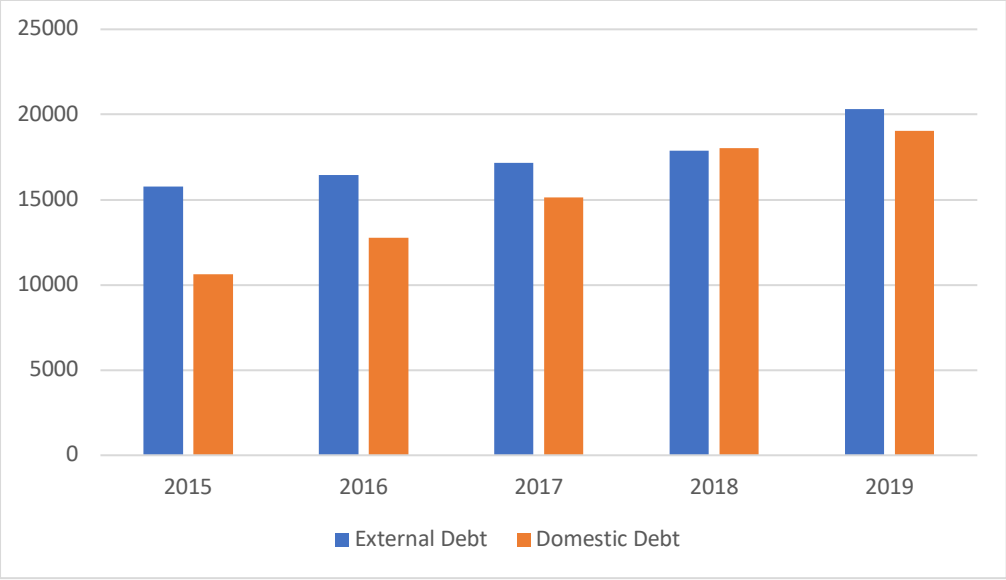
Table 25 Contribution of Lenders to Ghana's Total Debts

| Type of Lender | 2018 | 2019 |
|---|---|---|
| Commercial | 41.1 | 48.6 |
| Multilateral | 35.7 | 32.1 |
| Bilateral | 6.7 | 6 |
| Others | 16.5 | 13.3 |

Source: Adaptation of Ministry of Finance and Economic Planning (2020b p. 16)

Figure 32 below shows that external loans dominate Ghana's debt portfolio even though the gap between external and domestic loans has been narrowing over time. Indeed, in 2018, the share of external and domestic loans were almost equal.

Figure 32 Composition of Ghana's Total Debt by Type ($ million)




Source: Ministry of Finance and Economic Planning (2020b p. 12)[68]

To see how costly these loans are, Table 26 shows the interest rates on Ghana's loans for 2015. Private creditors lend at significantly higher interest rates, ranging from 7 percent to 11 percent

[68] 2019 figures are provisional.

compared to the multilateral lenders whose loans attract rates between 0 percent to 1.25 percent or bilateral lenders where interest rates are about 4.5 percent.

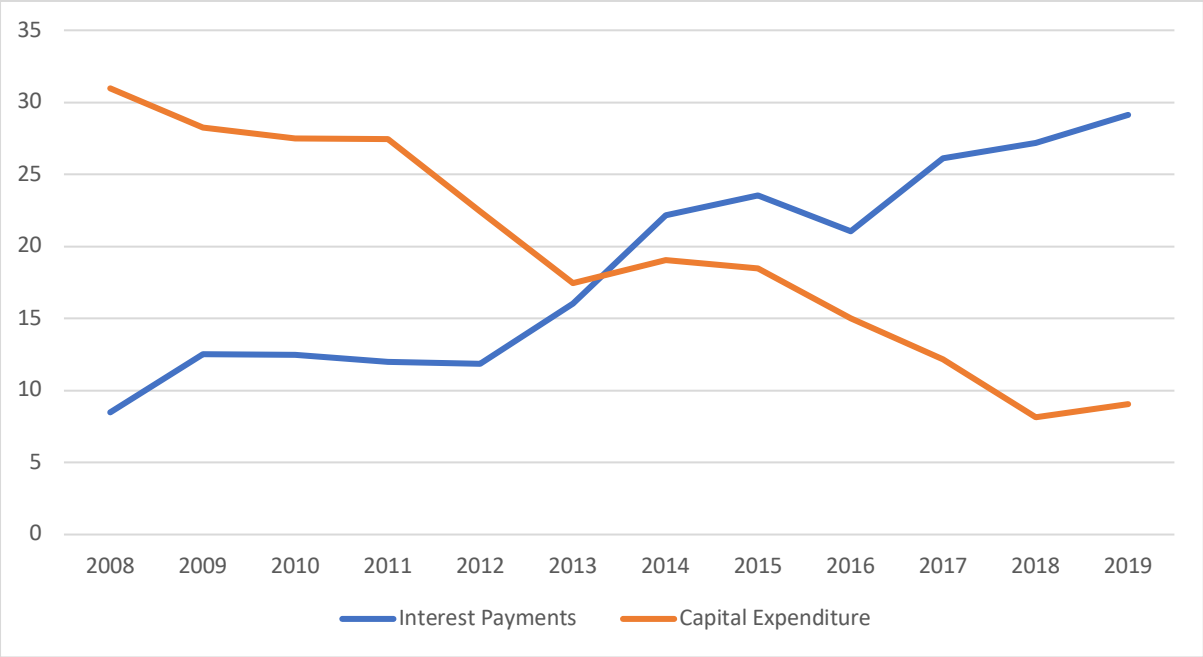
Table 26 Interest Rates on Ghana's Loans (2015)

| | Type of Lender | Interest rate (%) |
|---|---|---|
| **Private** | Domestic | 7 |
| | External | 7 -11 |
| **Official** | Multilateral | 0 - 1.25 |
| | Bilateral | 4.5 |

Source: Adaptation of Jones (2016 p. 30)

Apart from the high interest rates, the commercial external debt have shorter tenures and since they are often denominated in US dollars, the size of the debt expands whenever the local currency depreciates against the dollar (Ministry of Finance and Economic Planning, 2020b).

Figure 33 Ghana Interest Payments and Capital Expenditure (Per cent of Government Expenditure)




Source: Ministry of Finance and Economic Planning (2020)

Figure 33 provides a clearer picture relative to the issue of financing development in Ghana. While a greater proportion of Ghana's expenditure went into capital investments than interest payments for 2008-2013, its share declined steadily leading to a reversal in their relative positions. By 2014, the country was spending more servicing its debts than undertaking capital investments (see Figure 33). The two measures have diverged even further since then, and by

2019, whilst almost 30 percent of government expenditure was used to service debts, just 9 percent went into capital expenditure (see Figure 33). This situation was the reverse of 2008 when 30 percent of expenditure accounted for capital investments whilst 8 percent went into interest payments (see Figure 33).

To put this situation in perspective, I compare the budgetary allocations to the Ministries of Education and Health, which I use as proxies to measure the government's investments in social programmes, to interest payments made in those years. The information is provided in Table 27. Using absolute figures, in 2017, the allocation to the Ministry of Health (MOE) fell significantly when compared to interest payments for the same year. Although the allocation to education exceeded interest payments in 2017, by 2018 and 2019, both ministries were receiving lower allocations when compared to the monies set aside for interest payments.

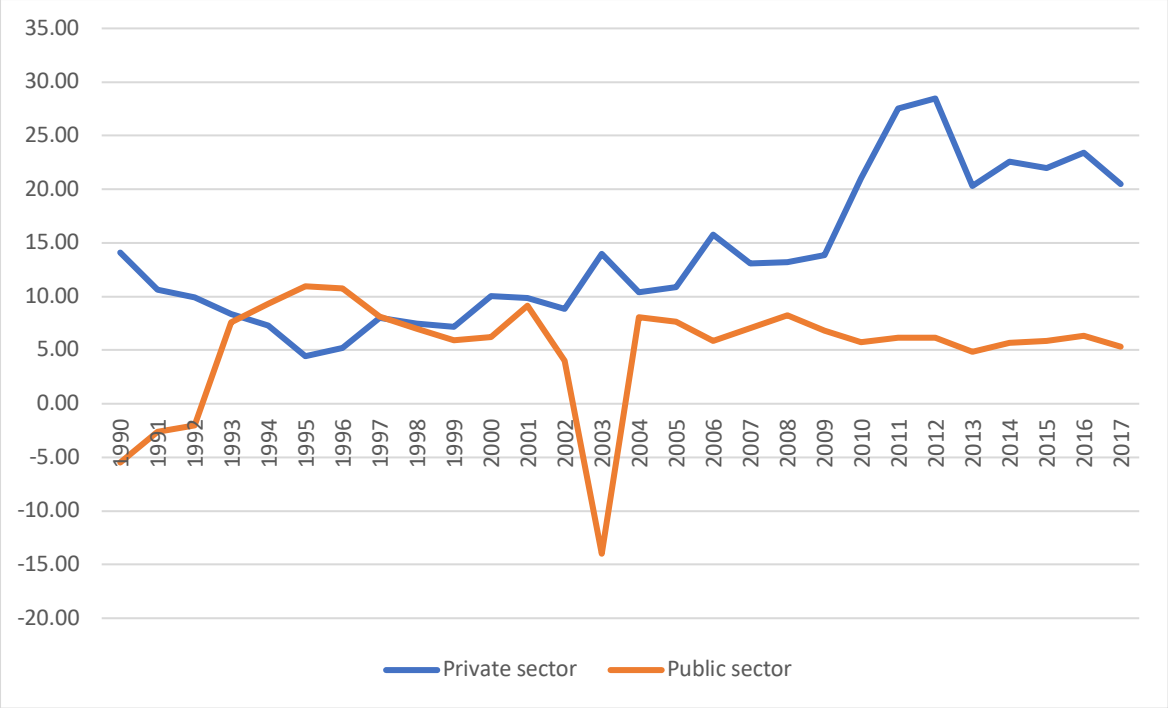
Table 27 Ghana Budgetary Allocations of Some Selected Expenditure Items (GHS million)

| | 2017 | 2018 | 2019 |
|---|---|---|---|
| Interest Payments | 13572.12 | 15821.82 | 19595.11 |
| Ministry of Health | 8452.3 | 4422.35 | 6037.51 |
| Ministry of Education | 16660.2 | 9258.84 | 12878.04 |

Source: Ministry of Finance and Economic Planning (2016, 2017, 2018, 2019)

Figure 34 below shows that total gross capital formation in Ghana has been generally led by the private sector over the recent two decades. Apart from a brief period in the 1990s (1993 – 1997) where public investments exceeded the private sector's, it has generally been declining, including growing at a negative rate in the early 2000s when debt unsustainability issues forced the country to enter the HIPC programme (International Monetary Fund, 2002). Indeed, even though the period after 2010 saw the onset of oil revenues and increased borrowing (Bawumia et al., 2017), Figure 34 indicates that the gross capital formation by the public sector was generally lower than that of the 1990s.

Figure 34 Ghana Growth Rate of Gross Capital Formation (Per cent of GDP)




Source: Author's illustration using data from African Development Bank (2021)

The foregoing analysis indicates that Ghana's current macroeconomic policies are not favourable for its structural transformation drive. I now discuss potential avenues to providing more stable financing for public expenditure.

**Alternative funding mechanisms**

In Nissanke (2019), she suggests a shift away from the international capital market, given its harsh and volatile repayment terms, towards domestic resource sources, including developing the domestic bond market in addition to exploring more concessional loans from multilateral and bilateral sources.

***Improving domestic revenue***

The challenges associated with raising tax revenues in developing countries like Ghana is well documented. However, Table 28 below shows other African countries that outperform Ghana in the collection of tax revenues. Indeed, as is shown in the table, Ghana's rate falls significantly below that of sub-Saharan Africa.

Table 28 Tax Revenue (Per cent of GDP)

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| Ghana | 10.94 | 18.26 | 11.29 | 11.85 | 12.57 | 12.28 |
| Namibia | 34.85 | 33.61 | 30.26 | 32.08 | 29.26 | … |
| South Africa | 26.54 | 27.34 | 27.11 | 26.95 | 27.47 | … |
| Zambia | 15.76 | 14.39 | 13.35 | 15.18 | 16.59 | … |
| Zimbabwe | … | 17.67 | 15.46 | 15.87 | 20.66 | … |
| Togo | 18.4 | 18.95 | 18.76 | 17.31 | 16.85 | 17.3 |
| Malawi | 15.93 | 15.24 | 15.49 | 17.29 | … | … |
| Rwanda | 12.95 | 13.29 | 14.41 | 13.45 | 14.25 | … |
| Mauritius | 18.47 | 8.99 | 18.13 | 18.55 | 19.12 | 19.94 |
| sub-Sahara Africa | 18.89 | 18.6 | 18.16 | 18.88 | … | … |

Source: World Bank (2021)

To put this into perspective, according to the Institute of Fiscal Studies (2017), if Ghana's tax revenue per GDP rate had been like that of South Africa on average (27 percent), the country would have achieved a fiscal surplus between 2012 and 2015.

According to Reuters (2018), over $600 million was lost by the country in the form of tax exemptions to the extractive industry. However, the International Monetary Fund (2019) indicates that a proper restructuring of the tax regime in the extractives sector could improve tax revenues by about 2 percent of GDP. They also opine that the country can generate almost 1 percent of GDP through a combination of new taxes and efficient collection of current ones. Some of the measures they suggest include a reintroduction of taxes that were removed in a bid to spur investments or boost productivity in particular sectors like financial services.

At the same time, given the large informal sector of the country (about 90 percent according to the Ghana Statistical Service (2016)), the ability of the government to tax the majority of the working force and businesses is constrained (Institute of Fiscal Studies, 2017). According to the Institute of Fiscal Studies (2017), a mere 8 million people in Ghana can be taxed and out of that, the government struggles to collect taxes from more than half of them.

Ghana's financial sector can potentially serve as an important source of raising funds. Table 29 below indicates that the government relies on banks, including the central bank, for almost 50 percent of its loans. In addition, it can be argued, based on data in Table 29, that there is

considerable room for the government to improve the ability of the non-bank sector to supply it with loans by developing the domestic bond markets.

Table 29 Share of Ghana's Domestic Debt by Lenders (Per cent)

| Category | | 2018 | | 2019 | |
|---|---|---|---|---|---|
| Banking Sector | Bank of Ghana | 19.7 | 44.7 | 14.8 | 44.3 |
| | Banks | 24.9 | | 29.5 | |
| Non-bank sector | Individual investors | 6.5 | 25.3 | 8.2 | 30.7 |
| | Firms & institutions | 16.8 | | 21 | |
| | Rural banks | 0.5 | | 0.7 | |
| | Insurance companies | 0.5 | | 0.6 | |
| | SSNIT | 0.9 | | 0.3 | |
| Foreign sector | Foreign investors | 30.1 | 30.1 | 25 | 25 |

Source: Ministry of Finance and Economic Planning (2020b p. 26)

Table 30 below shows the sectoral breakdown of market capitalisation on the Ghana Stock Exchange for January 2021. The data shows that the capital market is dominated by mining companies, banks and telecommunications in terms of market capitalization. A further look into the components in each category shows that a few large companies are driving the market capitalisation of the stock exchange. For instance, for ICT, MTN Ghana contributes about 99 percent in the ICT category and in the mining category, Tullow Ghana and Ashanti Gold also account for 98 percent of market capitalization in the mining category (Ghana Stock Exchange, 2021). The finance sector is more diversified and has many commercial banks contributing to the high market capitalisation (Ghana Stock Exchange, 2021).

Table 30 Share of Ghana Stock Exchange Market Capitalisation by Companies as at January 2021

| Sector | Issued shares (million) | Market Capitalisation (GHc million) |
|---|---|---|
| Mining | 1883.86 | 32813.61 |
| Finance | 27,775.63 | 11869.82 |
| ICT | 12324.47 | 8358.54 |
| Distribution | 1033.83 | 927.23 |
| Manufacturing | 671.43 | 539.23 |
| Food & beverage | 2582.8 | 478.26 |
| Insurance | 366.54 | 254.9 |
| Agriculture | 34.8 | 69.6 |

| | | |
|---|---|---|
| Advertising & Production | 118.89 | 10.7 |
| Education | 96.08 | 10.57 |
| Exchange Traded funds | 0.01 | 0.53 |
| Total | 46888.34 | 55332.99 |

Source: Ghana Stock Exchange (2021)

The dominance of only a few large firms on the capital market implies that there is still room for Ghana to "*increase the depth of the domestic investor base*" (Shand, 2019, p. 8). Such efforts to deepen the financial system not only supports investments in the private sector but also allows the capital market to be a deeper source of finance for the government.

## 9.4 Conclusion

In this chapter, I have evaluated Ghana's economic performances at the meso and macro-level, in light of my motivation to understand why Africa's structural transformation has made slow progress.

My comparison of the manufacturing sectors of Ghana and Thailand shows that Thailand has a stronger sector, measured by its contribution to GDP and the quantity of complex products it exports. Ghana's manufacturing sector on the other hand is weak considering its slow growth since the 1990s. In addition, only a small proportion of its manufacturing exports are considered as being complex. Fu et al.'s (2014) study suggests that manufacturing firms in Ghana are part of a nascent sectoral innovation system that comprises of buyers, suppliers, internet and the cluster. However, one can infer that the technological capabilities of the firms are relatively weak, reflected in the fact that Ghana does not export significant quantities of complex manufactured products.

At the macro-level, I argue that Ghana's current macroeconomic policy environment hampers the effective formulation and implementation of policies, and this undermines the kind of long term planning and focused investments for development as advocated by Nissanke (2019). This in turn results in the wastage of resources. I also add that the coordination of the different sectoral or development policies is constrained given the disjointed nature in which policies are formulated. Furthermore, in evaluating the institutional capacity of Ghana to promote its structural transformation, I show that despite having a relatively strong educational system

compared to other countries in Africa, Ghana still lags behind many other developing economies, including Thailand, when it comes to the educational system. This problem has resulted in a general lack of sufficient skilled personnel for the various sectors. Additionally, as a result of the disjointed nature of policy design and implementation, Ghanaian personnel are unable to build up their experiences to improve the country's institutional capacity.

I also examine the issue of sustainable financing for development in Ghana. I show that under Ghana's current framework, efforts to boost investments to foster the kind of "*big push*" (Nissanke, 2019, p. 108) expenditure is likely to induce only macroeconomic instability. This is especially the case as Ghana, upon achieving middle income status, has turned to more unstable financing sources such as the international capital market (see Tables 25 and 29). I examine Ghana's local revenue sources like taxes and the capital markets. I mention that there is a greater scope for Ghana to improve its tax collection. Additionally, by promoting more local investments in the domestic capital market, Ghana can enhance its local revenue sources to mitigate against its reliance on foreign commercial loans (Shand, 2019).

# Chapter Ten

## Conclusion

### 10.0 Introduction

The main motivation for embarking on this study has been to gain some insight into why the structural transformation of African economies has been slow. Given that it is generally accepted that innovation is central to the structural transformation process and is influenced by the acquisition of knowledge and subsequent buildup of technological capabilities, I set out three research questions for this thesis: 1) to establish the factors influencing innovation in GVCs; 2) to examine how tuna firms deepen their technological capabilities to upgrade in GVCs and 3) to explore how the skills, knowledge and innovation the tuna firms gain get diffused into the rest of the economy through linkages. My empirical analyses have focused on the tuna industry because I have chosen to undertake a sectoral analysis of innovation at the micro-level of the economy.

To answer the questions, I have conducted critical literature reviews and empirical analyses, the findings of which are presented in the relevant chapters. Therefore, in this final chapter, I bring together all the analysis carried out so far in this study. I discuss the findings within the context of my research questions and background motivation. In addition, I specify some policy issues that arise from these findings as well as identify some important themes that may be explored further due to their insufficient treatment in this research.

The rest of this chapter is structured as follows; Section 10.1 contains a summary of the main findings of this study. This is organised around the research questions and summary findings reported in the previous chapters. The discussion under the first research question, which is the main one, provides an overview of the general findings of this study whilst the sub-questions delve into specific details. Although not a direct answer to any research question, part (d) of this section attempts to contextualise my findings relative to the motivation behind this study, that is, the concern over Africa's long-standing structural transformation objective.

In Section 10.2, I discuss policy implications of my findings and areas for future research that have emerged from this thesis. Since the empirical analysis in this study is a comparative one,

I mention some of the successful measures pursued by the Thai government that have accounted for the success of its tuna industry. I highlight the areas in this thesis and the literature that require further examination due to their inadequate investigation.

## 10.1 Main Findings

### a. Innovation in GVCs

My study has sought to go beyond the simple binary approach towards GVCs where they are often considered as being either good or bad for developing countries in their bid to attain structural transformation. Rather, using the idea of a "learning economy" à la Stiglitz and Greenwald (2014), I have investigated the role of GVCs in the knowledge accumulation process of a country. The main features of learning that I have teased out of the existing literature and which my empirical analyses have underscored are that it is: 1) "*a cumulative and path dependent process*" (Lundvall, 2007, p. 101)[69] and 2) ubiquitous and influences all development processes in the economy (Lundvall, 2016).

My study has demonstrated that how a supplier enters a GVC, the mode of its interaction with the lead firm, its activities and upgrading outcomes are all influenced by the supplier's knowledge, which is in turn determined by the quality of the underlying learning process in its country. This is in sharp contrast to the conventional wisdom that it is just developments in the GVC alone that matter for innovation. In fact, in some cases, the governance structure in the GVC inhibits knowledge transfer from the lead firm but the suppliers are still able to upgrade.

Based on the foregoing, GVCs cannot be the starting point of the learning process for developing countries as predicted in conventional circles. Put differently, without an adequate prior learning process and building up of capabilities, the participation of firms in GVCs may be undermined and the transfer of knowledge, even when it happens, will not be enough to spark the process of learning and innovation in the entire economy required for structural transformation.

[69] Although the quote from Lundvall (2007) refers to innovation as a whole, I apply it to learning.

### b. Upgrading in tuna value chains

Thailand has been successful in the global tuna industry because the learning process underpinning its tuna production has been extensive. The country has accumulated knowledge over time not only during the life span of its tuna industry, which only started in the 1970s (Crough, 1987), but much earlier as existing entrepreneurs started advancing into new industries (Simon, 1996), enabling them to accrue knowledge and skills.

This accumulation of knowledge has not only occurred amongst the entrepreneurs but in many aspects of the economy including the financial system, policy making and state agencies. In other words, in the case of Thailand, the concept of the "learning economy", even though not fully present, is still significant as many different sectors have built up their capabilities overtime. This phenomenon has not occurred sufficiently in Ghana, which has not developed a critical mass of entrepreneurs with long history in business, as implied by Amankwah-Amoah and Lu (2019), leading to the accumulation of knowledge overtime. Many other sectors such as the financial system, the political system, the legal system and the institutional capacity of the state remain relatively underdeveloped, implying that learning in the economy has been stagnant.

Overtime, Thailand has developed several tuna firms, supporting institutions and agents of learning that together constitute a potent sectoral innovation system unlike Ghana where such a system remains weak. This has influenced the way the Thai and Ghanaian tuna firms have interacted with GVCs. Thailand entered global tuna production and supply as contract manufacturers with prior capabilities and the new knowledge they gained from lead firms only added to their existing stock. Following Cohen and Levinthal's (1990) arguments, I argue that by virtue of the firms' existing stock of knowledge, they had greater absorptive capacity which allowed them to better assimilate and utilise the knowledge they gained from their lead firms. The result of this has been their ability to produce more complex tuna products including those with advanced packaging materials. In addition, the superior capabilities of some of the firms have enabled them to undertake global transactions including the acquisition of lead firms (a history of Thai Union's acquisitions is undertaken by Pananond (2013)). Even those Thai tuna firms which cannot afford to use such routes are exploring new markets to establish their presence. I argue that the knowledge from lead firms were more influential at the early stages of the country's tuna industry as they sought to export to premium tuna markets. Today, as a

result of the country's strong sectoral innovation system which has assimilated and diffused the knowledge from the GVCs, the role of lead firms in the capability-building process of the suppliers is relatively limited.

Ghana's experience in the tuna GVC has been different since it appears locked in the same position in the chain, producing basic tuna products for its buyers. It appears that the direction of the firms and the tuna industry is driven by foreign players and any development in the firm must align with the objectives of their owners. By relying on the tuna GVC to drive the learning process in the firms and the economy, the country has basically outsourced the pace and direction of its development to the foreign firms.

**c. Linkages generated by tuna industry.**

My study makes me skeptical of the widely accepted idea that upgrading of firms in GVCs is indicative of a country's progress particularly in relation to its economic development agenda. This skepticism is based on my observation that despite Ghana's poorly developed sectoral innovation system as well as the weakness of the learning process in the entire economy, the tuna firms can theoretically undergo upgrading in the chain. This is despite the way they have integrated into the GVC.

It is possible that if the strategy of lead firms changes, they will invest in their subsidiaries, raising their capabilities to undertake product and even process upgrading. Also, foreign or even local investors can simply raise funds to acquire a lead firm and move to the top of the chain. These possibilities may then suggest that the countries can skirt around the long and arduous process of developing domestic learning processes in order to upgrade.

However, I argue that this proposition is tenable only if upgrading in GVCs is an end, which seems to be the position of the mainstream discussions on GVCs. My case is that in order to give upgrading in GVCs a developmental perspective, the issue of linkages must be considered. Thailand has proven that a country's agro-processing sector can be significantly expanded, strongly linking the primary and secondary sectors of the economy. Tuna firms benefitted from the knowledge early Thai entrepreneurs gained in industrial activities and as these firms have

deepened their capabilities in the industry, including gaining knowledge from lead firms in GVCs, they have extended these skills to promote other industries.

Interestingly, for those sectors that Thailand has not fully developed a strong sectoral innovation system or which the country has not deeply accumulated knowledge over time, such as ship-making, linkages from the tuna industry are weak which underscores the need for learning to be economy-wide for even development.

As it stands today, Ghana's tuna industry, particularly the processing node, acts as an enclave industry. This disconnection from the rest of the economy underscores why strong domestic learning processes are necessary since they serve as a vehicle for the transmission of knowledge from one industry to another. Even if the tuna processors experience upgrading, their limited interactions with other industries as well as the weak sectoral innovation system will restrict the spread of the knowledge. This hampers economic development.

**d. Developing a conducive macro-environment for structural transformation**

For Ghana to induce economy-wide learning processes to stimulate upgrading and linkage formation and eventually the structural transformation process, it will have to make improvements to the macroeconomic conditions that influence actions at the micro level. This includes reforming the policy-making framework which is currently used as a tool to satisfy short-term electoral objectives rather than long term development goals. This will curtail the current phenomenon of disjointed development policies which affects the coordination of policies and the institutional capacity of the country, particularly as personnel are unable to build know-hows and experiences over a sustained period due, for instance, to the instability associated with their employment (Ofei-Aboagye, 2018).

In addition, to stimulate sustained public investments in the economy, Ghana's macroeconomic policies, which are primarily geared towards achieving price stability as its macroeconomic policy goal, must have a developmental perspective. I have demonstrated that Ghana's ascension into middle-income status has also made it vulnerable to macroeconomic instability as some traditional sources of revenues such as grants and concessional loans have shrunk and more costly options such as commercial loans from international capital markets have become

dominant (see Tables 25 and 29). I argue that Ghana can improve its domestic revenues by boosting tax collections (Institute of Fiscal Studies, 2017; Shand, 2019) and developing its domestic capital markets (Shand, 2019). Such measures will reduce the country's reliance on the costly options and can support investments in the country's development agenda.

## 10.2 Policy Implications and Areas for Further Research

### a. Policy implications

#### i. Stronger state action

Thailand's experience shows that the state plays an integral role in stimulating the development of the sectoral innovation system for the tuna firms. As noted in Chapter 6, until the 1970s, Thailand had no tuna industry, however, the state directly intervened to promote the establishment of a local industry by providing an incentive package for entrepreneurs to invest in the sector (Crough, 1987). In recent times, the Thai government has sought to promote innovation in these industries by directly supporting research collaborations between some Thai firms like Thai Union and local universities (Thai Union, 2020). Such a direct, interventionist role, flies in the face of many conventional arguments and elevates the role the state can play beyond simply providing macro stability for investments.

#### ii. Engendering economy-wide learning processes

My study has emphasised the importance of learning in the development process. As the evolutionary and innovation systems schools have reiterated, the buildup of capabilities for firms depends on the accumulation of learning across the various sectors of the economy over a sustained period. This has been Thailand's main advantage leading to its dominance in the tuna industry. Ghana's preoccupation should be developing economy-wide learning processes à la Stiglitz and Greenwald (2014), instead of being fixated on merely ascending GVCs. Such measures, per Nissanke's (2019) argument, require designing, implementing and harmonising development policies based on a long-term development strategy buttressed by "*sustained productive public investments*" (Nissanke 2019, p. 107).

### iii. Focus on domestic and regional value chains

Thailand has shown that the domestic and regional chains complement, and in some cases, must be pursued first before moving into global chains. My analyses have indicated that the Thai market has served as an important platform for tuna firms to test and build up their capabilities, reducing the firms' dependence on international buyers. In addition, stronger regional ties means that the Asian market has become important for the Thai tuna firms, particularly for many of the small firms that are shut out of the European and North - American markets. Given the challenges involved in entering global chains, small Ghanaian tuna firms can potentially use the Ghanaian market to hone their capabilities, and like the small tuna firms in Thailand, they can target regional markets instead of competing with powerful firms in the mature markets.

### iv. Emphasis on the agro-processing industry

My study has demonstrated the potential for extensive linkages to be fostered among the various types of agro-processing activities such as seafood and fruits and vegetables. Currently, Ghana's tuna industry acts as an enclave one. However, by investing in the production of raw materials, fostering the formation of clusters and supporting the development of capabilities of the producers, the state can stimulate the growth of the agro-processing industry, which offers a pathway to getting a foothold in manufacturing. Given the potential for expansion in agro-processing activities, which covers lots of different sectors, the resulting impact on employment, revenue and resource accumulation is potentially large. Global firms have emerged from the Thai agro-processing industry and as shown in Chapter 8, they can serve as a gateway into more complex manufacturing or global dominance through the acquisition of international firms. Large firms that emerge in the agro-processing industry can accumulate financial resources to undertake investments which can gradually support the country's shift into more complex manufacturing sectors.

### v. Development finance

My analysis has shown that the withdrawal of some financial support for Ghana by its bilateral and multilateral backers upon its elevation into middle income status may have been premature.

Ghana's foray onto the international capital markets has greatly challenged its development prospects given the risks it contends with. This implies that Ghana's focus should be on exploring funding sources with more generous terms than what it gets on the international bond market. Importantly, Ghana should adopt significant reforms to improve the size of its domestic revenues to support its development agenda (Institute of Fiscal Studies, 2017; Shand, 2019). Part of this drive will require structural reforms and therefore the issue of policy design, implementation and coordination must be closely looked at.

### b. Future research

#### i. Social upgrading

Barrientos et al. (2010)'s framework on social upgrading is an under-researched area in GVC studies and the scope of this research did not allow a comprehensive examination of the phenomenon in the tuna industry. The preliminary observations I made however indicates that the concept has significant implications for the socio-economic development of workers, particularly low-skilled ones, in the economy. Without the incorporation of social upgrading, it becomes difficult to determine if upgrading processes benefits the economy as a whole and what can be done to ensure that vulnerable workers are protected. The current empirical studies on social upgrading must be extended to cover a wider range of global chains to gain sufficient insights into the phenomenon. There is also the opportunity for the merger of labour economics and GVC studies which has so far not been sufficiently done.

#### ii. Institutions

In Chapter 2, I indicate that the innovation systems framework encompasses both evolutionary and institutional economics (Nelson and Nelson, 2002). In reality, empirical studies tend to accentuate the aspects on technologies and capabilities without adequately exploring the necessary institutional configurations to be in place. This may be a problem associated with the methodologies employed, which are in turn influenced by the difficulty in properly examining institutional factors and conditions. However, these factors matter and will enrich the analysis. As I mention in Chapter 2, at the macro-level, Chang and Andreoni (2019)'s framework of social capability addresses the issues of institutions and how they support

development at the sectoral level. This has not been adequately integrated into micro-level frameworks such as the sectoral innovations system model.

### iii. Functional upgrading

The use of acquisitions and mergers to rise in global chains is a phenomenon that has not been adequately treated in the GVC literature. The observations made in this study imply that this may be a faster route than the traditional understanding on functional upgrading suggests. It also highlights a possible merger of the literature on financialisation with the GVC literature.

### iv. Extension of analysis to different countries and GVCs

I am interested in extending my analysis to different GVCs and different African countries to ascertain whether my main findings regarding the scope of the GVC framework's influence over structural transformation in Africa can be applied to different situations. The differences in the various GVCs and country situations will enrich the discourse.

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# Appendix A

Consent form template used for fieldwork

**PARTICIPANT CONSENT FORM**

**Introduction**

The purpose of this form is to provide you with information so you can decide whether to participate in this study. Any questions you may have will be answered by the researcher or by the other contact persons provided below. Once you are familiar with the information on the form and have asked any questions you may have, you can decide whether or not to participate. If you agree, please either sign this form or else provide verbal consent

| | |
|---|---|
| **Research title:** | [Include an alternative title if the official title of your thesis or project would be difficult for research participants to understand.] |
| **Type of Project** | [e.g. PhD Research, Funded Research Project] |
| **Project funders:** | [Include the funders of the project, and any interest which they may have in the research or control over use of the research.] |

| | |
|---|---|
| **Project partners:** | [Include any other organisations (e.g. other HE institutions) which are involved with SOAS in delivering the project, and what involvement they may have in the data.] |
| **Research coordinator:** | [Give the name and work contact details of the person (usually the researcher) who is responsible for the project.] |
| **Purpose of Research:** | [Describe background, aims and duration of the project in as clear a language as possible and simple enough to be understood by research participants] |
| **Reasons for data collection:** | [Describe why you have chosen the research participant for your data collection and who how many other participants you will collect data from] |
| **Nature of Participation** | [Describe the procedures involved with the data collection e.g. duration of interviews; recording method; technology; who will collect the data; whether personal data will be anonymized; use of audio recordings] |
| **Risks and Benefits of participation** | [Explain any benefits for the participant in being involved in the research and also any risks, inconvenience or distress that could be caused by participation] |
| **Data Sharing:** | [Indicate any individuals or organisations outside SOAS who will receive or be given access to non-anonymised personal data gathered in the project.] |
| **Countries to which the data may be a transferred:** | [Researcher to complete. Indicate any specific countries to which the data may be transferred, including the UK if the data is gathered outside the UK. The form also should include the following text:<br><br>Data about you gathered in the course of your participation in this project may be transferred to countries or territories outside the European Economic Area for purposes connected with this project and similar future projects, subject to appropriate safeguards to protect the security and confidentiality of your data. |

| | |
|---|---|
| **Security measures:** | [Describe in a general way any special security measures which will be put in place to protect research participants 'data during the life of the project e.g. encryption, secure storage, password protection] |
| **Methods of anonymisation:** | [If you plan or need to anonymise the research data then describe the steps which will be taken to remove identifying information from your data set and publications] |
| **Methods of publication:** | [Describe how the data and the research results will be published, including whether research participants will be anonymized in the published information or PhD theses and where this published information will be available e.g. Open Access via the internet] |

**Withdrawal of Consent**

Please note your participation is voluntary and you may decide to leave the study at any time. You may also refuse to answer specific questions you are uncomfortable with. You may withdraw permission for your data to be used, at any time up to [Researcher to enter date or point in project when it is no longer possible to withdraw consent for use of personal data e.g. when data has been anonymized] in which case notes, transcriptions and recordings will be destroyed. Withdrawal or refusal to participate will not affect your relationship with [Insert name of organization to which research participant belongs if you are doing research in an organization. Remove this statement if not appropriate].

**Data Protection Statement**

Information about you which is gathered in the course of this research project, once held in the United Kingdom, will be protected by the UK Data Protection Act and will be subject to SOAS's Data Protection Policy. You have the right to request access under the Data Protection Act to the information which SOAS holds about you. Further information about your rights under the Act and how SOAS handles personal data is available on the Data Protection pages of the SOAS website (http://www.soas.ac.uk/infocomp/dpa/index.html), and by contacting the Information Compliance Manager at the following address: Information Compliance Manager, SOAS, Thornhaugh Street, Russell Square, London WC1H 0XG, United Kingdom (e-mail to: dataprotection@soas.ac.uk).

**Copyright Statement**

By completing this form, you permit SOAS and the research to edit, copy, disseminate, publish (by whatever means) and archive your contribution to this research project in the manner and for the purposes described above. You waive any copyright and other intellectual property rights in your contribution to the project, and grant SOAS and researchers who are involved, a

non-exclusive, free, irrevocable, worldwide license to use your contribution for the purposes of this project. If you wish to receive a copy final published research outputs once completed I will happy to provide you with an electronic copy

**Contact Information**

Telephone No: [Include both your UK mobile number and the local phone number you will use or set up]

Email Address:

Postal Address:

Alternative contact: [Include your supervisor's name and contact details or other colleagues on your research project]

**----------**

**Research Participant Declaration**

I confirm that I have read the above information relating to the research project. I freely consent to my information being used in the manner and for the purposes described, and I waive my copyright and other intellectual property rights as indicated. I understand that I may withdraw my consent to participate in the project, and that I should contact the project coordinator if I wish to do so.

**Participant Name:**

**Signature:** **Date:**

**Researcher Name:**

**Signature:** **Date:**

PLEASE KEEP THIS FORM FOR FUTURE REFERENCE

# Appendix B

Interview List

| Organisation | Category | Form of Response | Date of Interview | Case Number |
|---|---|---|---|---|
| Firm A | Tuna fishing company | Written answers | 19/09/2018 | TF1 |
| Firm B | | In-person interview | 19/09/2018 | TF2 |
| Firm C | | Written answers | 30/10/2018 | TF3 |
| Firm D | | Written answers | 02/11/2018 | TF4 |
| Firm E | Tuna cannery | Written answers | 31/10/2018 | TC1 |
| Ghana Tuna Association | Tuna agency | In-person interview | 06/11/2018 | TA1 |
| Marine Fisheries Research Department (Fisheries Commission of Ghana) | | In-person interview | 09/10/2018 | TA2 |
| National Fishermen Association of Ghana | | In-person interview | 09/10/2018 | TA3 |
| Ghana Standards Authority | | In-person interview | 29/10/2018 | TA4 |
| Firm F | Other manufacturing company | Written answers | 17/10/2018 | OM1 |
| Firm G | | Written answers | 01/11/2018 | OM2 |
| Firm H | | Written answers | 05/11/2018 | OM3 |
| Firm I | | Written answers | 07/11/2018 | OM4 |
| Firm J | | Written answers | 11/11/2018 | OM5 |
| Firm K | | Written answers | 12/11/2018 | OM6 |
| Youth Employment Agency | Non-tuna agency | In-person interview | 02/10/2018 | NT1 |
| African Development Bank | | In-person interview | 03/10/2018 | NT2 |
| National Vocational Training Institute | | In-person interview | 05/10/2018 | NT3 |
| Suame Metal Cluster | | In-person interview | 15/10/2018 | NT4 |
| Ministry of Trade and Industry | | Written answers | 31/10/2018 | NT5 |
| Regional Maritime University | | In-person interview | 02/11/2018 | NT6 |

| | | | | |
|---|---|---|---|---|
| Unicord (Workers Union) | | In-person interview | 07/11/2018 | NT7 |
| Fisheries expert (University of Energy and Natural Resources) | Researchers/Experts | In-person interview | 11/10/2018 | R1 |
| Industrial economist (University of Ghana) | | In-person interview | 31/10/2018 | R2 |
| Fishery economist (University of Ghana) | | In-person interview | 08/11/2018 | R3 |
| Policy consultant | | In-person interview | 09/11/2018 | R4 |
| Fisheries consultant (World Bank) | | Skype interview | 16/11/2018 | R5 |
| Financial consultant | | Skype interview | 25/11/2018 | R6 |
| Researcher | | Skype interview | 05/04/2019 | R6 |

# Appendix C

Letters

1. Request for interview

Dear Sir/Madam,

FIELDWORK INTERVIEW

As indicated in the introductory letter provided by SOAS, University of London, I am a PhD student undertaking a fieldwork exercise in Ghana. My research is on "*Global Value Chains and Structural Transformation in Ghana: Case study of Ghana's Tuna Industry*". I am by this letter requesting for an interview with your organization, which I have identified as an important stakeholder in the industry.

The interview will mainly focus on knowledge of the firm, its activities and industry issues
All the standard ethical requirements for the interview will be followed and explained to all participants. A consent form stipulating the rights of the participants (including the protection of identity) and the scope of use of the data collected will be explained and provided for all participants to assent.

Thanks for your cooperation.

Best regards,

Roland Baimbill-Johnson
055 250 4 666
rolandobj@gmail.com

2. Request for written questions to be filled

Dear Sir/Madam,

RESEARCH QUESTIONNAIRE

As indicated in the introductory letter provided by SOAS, University of London, I am a PhD student undertaking a fieldwork exercise in Ghana. My research is on "*Global Value Chains and Structural Transformation in Ghana: Case study of Ghana's Tuna Industry*". I have identified your institution as an important stakeholder with regards to my research.

To deepen my understanding of the tuna industry, I have attached to this letter, a questionnaire which seeks to gather knowledge on your firm activities as well as important themes I have identified relating to structural transformation. I will be very grateful if you could spare some time to answer these questions which will be immensely helpful to my research. A consent form (2 copies) has also been attached which provides all the information regarding the research, your rights, how the data you provide will be used and protected. Please take your time to go through the form and give your permission before proceeding to answer the questions. I am available to provide further clarifications if needed. You will keep a copy of the consent form whilst the researcher keeps the other copy.

I am grateful for your help and will be glad if the form will be completed by early October.

Thanks for your cooperation.

Best regards,

Roland Baimbill-Johnson
055 250 4 666
rolandobj@gmail.com

# Appendix D

List of Questions

1. Tuna fishing companies

| Question | Response |
|---|---|
| 1. Name of firm | |
| 2. No. of years in existence/operation | |
| 3. Type of firm | Limited Liability □<br>Partnership □<br>Sole-Proprietorship □<br>Other □<br><br>*If other, please specify here* |
| 4. What is the ownership structure? (e.g 50% foreign ownership, 50% local ownership)<br><br>*If possible, please state the nationality of the foreign owners* | |
| 5. Are Ghanaians employed in senior management positions? What nationalities are the other workers in senior management?<br><br>*Please state which roles* | |
| 6. What is the main activity undertaken by the firm?<br><br>*Please state other activities also undertaken by the firm* | |
| 7. What is the size of the workforce?<br><br>*Please provide a breakdown if possible; e.g. 50 senior management, 30, fishermen* | |
| 8. What are the main tuna species captured by the firm? | |
| 9. Where are the tuna species mainly supplied (export destinations)? | |

| | |
|---|---|
| *Please state the main destinations in order of prominence in the last ten years* | |
| 10. What percentage of tuna is supplied to the local market? | |
| 11. Which type of fishing vessel(s) does the firm operate?<br><br>ii. where are these vessels produced? Did the firm buy them from the manufacturer or from other fishing firms? | |
| 12. Are the vessels owned or leased by the firm? *If they are leased, from which country or firm* | |
| 13. How many vessels does the firm operate? | |
| 14. What is the cost of acquiring/leasing a vessel?<br><br>ii. What are the comparative rates in other countries? | |
| 15. What has been the average price of tuna over the last 5 years?<br><br>*If prices differ according to tuna specie, please state*<br><br>ii. how are the prices determined? | |

| | |
|---|---|
| 16. What is the average tuna capture in a year?<br><br>*Please state according to tuna species if possible.* | |
| 17. What is the cost structure of the firm?<br><br>*Please state the main cost factors with estimated percentage of total cost (e.g. fuel 30%, wages 20%)* | |
| 18. What has been the profitability of the firm in the last five years?<br><br>*Please indicate whether the company has been operating at a profit or a loss over the last five years* | |
| 19. How does the firm supply international buyers? (e.g through trading companies, directly to buyers)<br><br>ii. Has the firm entered into a supply contract with any processing firm? Please state which country (and firm if possible) | |
| 20. What are the main export destinations for your tuna?<br><br>ii. What factors account for these destinations? | |

| | |
|---|---|
| iii. What factors constrain exports into other lucrative markets?<br><br>iv. Are there other potentially viable markets that are untapped? *Please give some details* | |
| 21. How does the firm get new buyers? | |
| 22. Who sets company strategy/objectives for the firm? (i.e does the firm set its own strategy or does it follow a strategy set by a parent company outside the country?) | |
| 23. Related to (22), if company strategy is affected by a parent company, what level of independence does the local company have? *i.e does the local company have to seek approval for all decisions such as investments made locally?* | |
| *24.* Are fishing decisions of the firm affected by other agents aside parent companies? (*e.g buyers through supply contracts, trading companies, the state)* | |

| | |
|---|---|
| *Please state these agents* | |
| 25. What is the level of control or influence over fishing crew by the fishing company? Who makes decisions relating to fishing; vessel crew or management of fishing firms? | |
| 26. Are the local fishermen on the vessels organised? (e.g. through a union) | |
| 27. How are the conditions of work of the fishermen determined? *i.e. through negotiations or set by the firm?* | |
| 28. What is the average wage paid to fishermen employed on the vessel?<br><br>ii. How does this wage level compare to what other fishermen are earning on other vessels?<br><br>iii. How do the wage levels compare to other African countries? | |
| 29. What factors influence this wage level? (e.g. minimum wage, comparative wages in other | |

| | |
|---|---|
| countries/industry, company budget constraints) | |
| 30. How are the fishermen selected? What skills/conditions must they have before being employed?<br><br>ii. what is their level of productivity? How does this compare to other countries? | |
| 31. What is the composition (and nationalities) of the vessel crew? *i.e. how many captains, engineers, fishermen* | |
| 32. What are the average wages for these positions mentioned in (31)? | |
| 33. Related to (31), if there are limited number of Ghanaians employed as captains and engineers, what accounts for this phenomenon? | |
| 34. Is there a skill gap in the local workforce to occupy the technical roles being performed by expatriates in the firm and on the vessel?<br><br>ii. Does the firm take steps to replace whatever foreign skills they have had to hire with local ones? If so, what steps do they take? | |

| | |
|---|---|
| iii. How quickly are local technicians or skilled workers able to learn from their foreign counterparts and then take over the particular activity?<br><br>iv. Are there training programmes conducted or sponsored by the firms to improve on the skills of local workers on the vessels? | |
| 35. What are the main raw materials used for production?<br><br>ii. Do you source these raw materials locally or they are imported? If you import them, why so?<br><br>iii. Are there plans to procure the raw materials from local sources (if they are imported)? | |
| 36. What are the main cost components in production?<br><br>*Please state these components with their estimated percentage of total cost (e.g. fuel 30%, wages 20%)* | |
| 37. Are Ghanaian workers exposed to important company activities such as | |

| | |
|---|---|
| negotiating supply contracts, engaging trading companies, marketing, establishing networks?<br><br>ii. what are some of the roles these Ghanaians play? | |
| 38. Has your firm hired workers that have worked with other fishing firms or multinational companies? | |
| 39. Has the firm diversified into other activities such as the capture of other fishes aside tuna?<br><br>ii. How feasible is the application of skills and transfer of resources from the fishing of tuna to the other fisheries? | |
| 40. Is there a difference in the quality of tuna supplied by your firms and other firms (in Ghana and other countries)?<br><br>ii. If so, what accounts for the differences?<br><br>iii. Has your firm taken efforts to improve the quality of tuna supplied to its clients? | |
| 41. Has the firm improved on its vessels and technology to improve on tuna yield? | |

| | |
|---|---|
| iii. How does the firm control costs and maintain profitability?<br><br>iv. What is the level of investments in research that has been undertaken by the firm in improving vessel technology, production process/methods, etc? | |
| 42. Has the firm expanded its activities into tuna processing?<br><br>ii. if no, what accounts for this? Who makes this decision and what are the constraints? | |
| 43. Is there a high turnover of workers in the firm? What factors account for this?<br><br>ii. which type of workers usually leave and where do they end up?<br><br>iii. Are workers of the firm regularly poached by other companies? which type of workers face this?<br><br>iv. does this firm seek to attract workers from other industries? Which roles do they usually occupy?<br><br>v. how does the firm protect its 'valuable' workers from leaving? | |

| | |
|---|---|
| vi. how are the skills and knowledge gained at the firm useful for other companies or industries? Which skills are very valuable for other companies?<br><br>vii. Does the company make efforts to protect its important assets, knowledge etc from being used by other companies? how is this done? | |
| 44. What is the general standard of living of workers? How does it compare to workers in other fishing companies?<br><br>ii. have there been strikes by workers over conditions of service within the last three years?<br><br>iv. what is the average number of years spent by a worker in the firm? | |
| 45. What proportion of tuna is supplied to domestic processors/retailers?<br><br>ii. What influences decisions to supply the local market or foreign markets? | |
| 46. Are current conservation schemes sustainable? | |

| | |
|---|---|
| ii. Is the survival/existence of the fishing company directly tied to the level of tuna stock in the sea?<br><br>iii. Are there alternative arrangements in place in the event that tuna stocks dramatically dwindle?<br><br>v. what arrangements does the firm undertake during periods of fishing bans? | |

2. Tuna processors

**Tuna Processors Questionnaire**

| **Question** | **Response** |
|---|---|
| 1. Name of firm | |
| 2. No. of years in existence/operation | |
| 3. Type of firm | Limited Liability □<br>Partnership □<br>Sole-Proprietorship □<br>Other □<br><br>*If other, please specify here* |
| 4. What is the ownership structure? (*e.g 50% foreign ownership, 50% local ownership)*<br><br>*If possible, please state the nationality of the foreign owners*<br><br>*If the firm is a subsidiary of a foreign firm, please state the nationality of the owners* | |
| 5. Are Ghanaians employed in senior management positions? What nationalities are the other workers in senior management? | |

| | |
|---|---|
| *Please state which roles*<br><br>ii. if there are limited number of Ghanaians employed in senior management or technical positions such as engineers, what accounts for this phenomenon? | |
| 6. What is the main activity undertaken by the firm?<br><br>*Please state other activities also undertaken by the firm*<br><br>ii. What are the brands the firm produces?<br><br>iii. Does the firm produce its own brands or produces on contract?<br><br>iii. What is the proportion of each brand in the firm's total product range each year? | |
| 7. What is the size of the workforce?<br><br>*Please provide a breakdown if possible; e.g. 50 senior management, 30 factory workers* | |
| 8. What are the main export destinations of the canned tuna?<br><br>*Please state the main destinations in order of prominence* | |
| 9. What percentage of canned tuna is supplied to the local market? | |

| | |
|---|---|
| ii. which brands are supplied to the local market?<br><br>iii. why are the (other) brands not supplied to the local market? | |
| 10. How many production facilities are owned by the the firm? | |
| 11. Were the facilities established by the firms or were they acquired/rented from another firm?<br><br>ii. if the facilities pre-existed the establishment of the firm, what were they being used for?<br><br>iii. Which of the resources in the acquired facilities are currently being used for tuna processing? (e.g. warehouse, machinery, etc.) | |
| 12. Do firms require specific licenses to operate in Ghana (apart from business registration requirements)?<br><br>ii. What are these other licenses? | |

| | |
|---|---|
| iii. What are the associated cost of these licenses? | |
| 13. What has been the average price of canned tuna over the last 5 years?<br><br>*If prices differ according to tuna specie, please state*<br><br>ii. how are the prices determined? | |
| 14. What is the average total canned tuna produced in a year?<br><br>*Please state according to tuna brands if possible.* | |
| 15. What are the main cost components in production?<br><br>*Please state these components with their estimated percentage of total cost (e.g. fuel 30%, wages 20%)* | |
| 16. What has been the profitability of the firm in the last five years?<br><br>*Please indicate whether the company has been operating at a profit or a loss over the last five years* | |
| 17. How does the firm supply international buyers? (e.g through trading agents, directly to supermarkets, directly to consumers) | |

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| 18. How does the firm establish contact with its international clients? E.g. through lobbying, aggressive marketing schemes, etc | |
| 19. Who sets company strategy/objectives for the firm? (i.e does the firm set its own strategy or does it follow a strategy set by a parent company outside the country?) | |
| 20. Related to (19), if company strategy is affected by a parent company, what level of independence does the local company have? i.e does the local company have to seek approval for all decisions such as investments made locally? | |
| 21. Are decisions of the firm affected by other agents aside parent companies? (e.g supermarkets, governments, etc)<br><br>*Please state these agents* | |
| 22. Does the firm own fishing companies which provide it tuna?<br><br>ii. If so, what form of control does it exercise over fishing decisions? i.e. does it control fishing decisions including vessels to use, supply targets etc? | |

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| iii. Does the firm rely on other fishing companies outside those it owns?? What arrangements are in place to ensure security of supply? E.g. supply contracts<br><br>iv. what are some of the conditions stated in such contracts? E.g. quantity to supply, price, species, etc<br><br>iv.What investments (if any) does the firm undertake to boost the capacity of fishing firms that supply to the firm? e.g. training in new methods, provision of technology etc. | |
| 23. How are fishing firms selected for supply of tuna?<br><br>ii. is there a competition for supply contracts?<br><br>iii. how does the firm leverage its position to ensure the supply of tuna at lower costs?<br><br>iv. where is the balance of power with regards to the supply of tuna fish? Ie. do fishing companies control price and quantity and are the processing firms price takers or do processing firms use their buying power to control price? | |
| 24. Who are the firm's buyers (clients)? Eg. supermarkets, other companies | |

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| 25. What level of control does the firm's buyer exert over decisions made by the firm? i.e. does the firm produce according to specifications of the buyer or according to it's own decisions? | |
| 26. How are the specifications of the buyer communicated? i.e. through contracts, through buying decisions of the buyer, through activities of competitors | |
| 27. What factors influence the setting of the price of the canned tuna products?<br><br>ii. to what extent do supermarkets influence the prices of the canned tuna products<br><br>iii. how does the firm protect its margins? | |
| 28. Does the firm's buyer (clients) conduct training (or do they make investments) in the firm?<br><br>ii. What is the level or form of engagement with the buyer in meeting specifications? Eg. does the buyer have a presence at the firm? | |

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| 29. To what extent are the firm's activities influenced or affected by the international trading environment? i.e. how critical are the trading arrangements or agreements between countries to the firm's activities?<br><br>ii. which current agreements affect the company?<br><br>iii. are such agreements important determinants of the survival or location decision of the firm? i.e. will a change in conditions of those agreements affect the continuous presence of the firm in Ghana?<br><br>iv. What role does the firm play in the negotiation of these agreements by the state? In what ways are the firm's concerns captured by the state when negotiating these agreements | |
| 30. How have standards/regulation in destination markets affected firm activities? | |
| *31.* How have changing conditions in the fishing node of the production chain affected firm activities? i.e. *does the tuna stock in the Ghana seas impact the continuous presence of the firm in Ghana?* | |

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| ii. what alternative arrangements are in place during periods when fishing is banned or supply is low? | |
| 32. How do macroeconomic conditions and other external factors affect firm activities?<br><br>ii. How have producers managed to mitigate against these challenges?<br><br>iii. What level of support has the state provided in supporting your firm meet these challenges? | |
| **33.** Was there a shortage of skilled local workers (engineers, technicians, management, etc) to undertake production activities in your firm? i.e. did your firm have to hire foreign workers or specially train local workers to perform some tasks?<br><br>*Please briefly explain* | |
| 34. Does the firm take steps to replace whatever foreign skills they have had to hire with local ones? If so, what steps do they take? | |
| 35. How quickly are local technicians or skilled workers | |

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| able to learn from their foreign counterparts and then take over the particular activity? | |
| 36. Has your firm hired workers that have worked with multinational companies?<br><br>ii. Is there a difference in the productivity of those workers from those who have no prior experience with multinational companies? *please state some of these differences if any* | |
| 37. Is the machinery used for production produced locally or imported?<br><br>ii. Were they manufactured according to the unique specifications of your firm?<br><br>iii. Did they have to be modified or adapted for use in Ghana? | |
| 38. If the machines were imported, is there capacity for them to be produced in Ghana (if given some training)? | |

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| ii. Has the firm explored this option? | |
| 39. Who undertakes repair and maintenance of these machines? If local engineers, did they require special training to be able to perform these operations?<br><br>ii. Can you say that the handling of these machines by local engineers gives them sufficient knowledge to produce them? | |
| 40. Who operates the machines? i.e local engineers or expatriate workers or manufacturers of the machines | |
| 41. What is the cost of training engineers or workers to use the technology?<br><br>ii. Who funds the training? | |
| 42. How many training programmes have been organised by the firm for workers in the last three years?<br><br>ii. Please state three of these programmes and the objectives | |

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| iii. Who were the participants? (i.e which kind of workers were the training modules designed for?)<br><br>iv. which consultants undertook the training? i.e. are they foreign consultants or local consultants | |
| 50. Can the machines be modified, converted or used to produce other products simultaneously? Eg. fruit processing | |
| 51. What type of skills are required to undertake the labour intensive activities in the firm? (eg. literary skills, etc)<br><br>ii. what level of education must workers attain before being employed? | |
| 52. How would you rank the productivity of your factory workers? *i.e. low, high, very high*<br><br>ii. how do you measure this productivity of workers?<br><br>iii. How does this impact firm activities? *i.e. how does the productivity of workers affect profitability of the firm* | |

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| iii. how does this compare to workers in similar firms in the country or outside the country? What accounts for the differences? | |
| 53. What accounts for the differences in productivity?<br><br>ii. what arrangements are in place to boost productivity of workers? | |
| 54. Are Ghanaian workers exposed to important company activities such as negotiating supply contracts, engaging trading companies, marketing, establishing networks?<br><br>ii. what are some of the roles these Ghanaians play? | |
| 55. What is the capacity of engineers and other workers trained by local institutions/universities to undertake operations in the firm? | |

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| ii. Does the firm have to conduct further training of these individuals? | |
| 56. In what ways has your firm improved the quality of canned tuna? *i.e. has the canned tuna produced by the firm in the last ten years improved in quality? How?* | |
| 57. Have the changes impacted sales/revenues? | |
| 58. What prompted the changes? Eg. low sales, changes in taste of consumers, etc. | |
| 59. Who makes decisions regarding to these improvements to the products? *i.e. parent company or the firm in Ghana* | |
| 60. Has the firm changed its production process to produce more efficiently since its inception? E.g. change the machines to more modern ones?<br><br>ii. Who makes decisions regarding to these improvements to the production | |

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| process? *i.e. parent company or the firm in Ghana*<br><br>iv. Does the firm undertake research and development? | |
| 61. Does the firm intend to produce more brands?<br><br>ii. If the firm does not produce its own brands, are there plans to produce their own brands?<br><br>ii. What are the constraints involved in expanding range of brands produced?<br><br>iii. Does the firm risk losing its contracts with existing buyers if it attempts to produce its own brand (if it does not produce its own brands?<br><br>62. what are the challenges with penetrating into new markets or selling new brands in a market?<br><br>ii. What are the challenges with acquiring existing brands in new markets? | |

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| iii. Is it more sustainable to outsource entire production of canned tuna to manufacturers to produce the brands on behalf of the firm? | |
| 63. Has the firm diversified its product range into industries which are (un)related to its main product line? *For instance, from fruit/vegetable processing, rice production, etc.*<br><br>ii. How feasible is the application of skills and transfer of resources from the processing of tuna to the production of other goods? *E.g. potential cost savings*<br><br>iii. Can machines and production processes for the production of one product be modified or adapted for use of another product?<br><br>iv. Is the potential transfer of skills from the production of one product to another product a solution to skill gaps amongst local workers?<br><br>*i.e. in other words, did you find the same challenges you had with respect to skill shortages* | |
| 64. What is the turnover of workers in the firm? | |

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| ii. which type of workers usually leave and where do they end up?<br><br>iii. Are workers of the firm regularly poached by other companies? which type of workers face this?<br><br>iv. does this firm seek to attract workers from other industries? Which roles do they usually occupy?<br><br>v. how does the firm protect its 'valuable' workers from leaving?<br><br>vi. how are the skills and knowledge gained at the firm useful for other companies or industries? Which skills are very valuable for other companies?<br><br>vii. Does the company take efforts to protect its important assets, knowledge etc from being used by other companies? how is this done? | |
| 65. What are the conditions of service for the workers? | |

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| iii. have there been strikes by workers over conditions of service within the last three years?<br><br>iv. what is the average number of years spent by a worker in the firm?<br><br>v. how does the condition of service of workers compare to the competition/industry? | |
| 66. Where does the firm source its tin cans from?<br><br>ii. if they are imported, will it be more efficient if they are sourced locally? Do local manufacturers have the capability to produce the cans?<br><br>iii. Does the firm provide support or investments in local producers such as the Suame Cluster to produce the cans? | |
| 67. Are current conservation schemes for tuna sustainable?<br><br>ii. Is the survival/existence of the company directly tied to the level of tuna stock in the sea?<br><br>iii. Are there alternative arrangements in place in the event that tuna stocks dramatically dwindle? | |

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| v. what arrangements does the firm undertake during periods of fishing bans? | |

**NB: can you please provide a schematic description of the processing of tuna on the factory floor? For example; (Tuna is washed. Then boiled. It is cooked and then cut into sizes and canned)**