

T.C.
MARMARA ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
İKTİSAT ANABİLİM DALI
KALKINMA İKTİSADI VE İKTİSADI BÜYÜME BİLİM DALI

**INDUSTRIALISATION AND ECONOMIC DEVELOPMENT IN AFRICA
AND ASIA: THE ROLE OF INDUSTRIAL POLICY, INSTITUTIONS AND
INVESTMENT CLIMATE.**

**AFRİKA VE ASYA'DA SANAYİLEŞME VE EKONOMİK
KALKINMA: SANAYİ POLİTİKASI, KURUMLAR VE YATIRIM
İKLİMİNİN ROLÜ.**

Doktora Tezi

Puruweti SIYAKIYA

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ÖZET

Sanayileşme ve sanayi politikası, ekonomik kalkınmanın kilit araçlarıdır; akademinin, politika yapıcılarının, uygulayıcıların ve kalkınma ortaklarının dikkatini çeken kalkınma gündemine geri döndüler. İmalat sektörünü hedefleyen sanayileşme, teknolojinin yükseltilmesi için bir kanaldır; dolayısıyla yakalama etkisini teşvik eder. Bazıları aktivist sanayi politikasının başarılı sanayileşmenin temelini oluşturduğunu iddia ederken, bazıları da piyasanın sanayileşmeye öncülük ettiğini öne sürer. Sanayileşme ve sanayi politikası başarısını ölçmek zor bir görev olduğundan, bu tez, seçilmiş Afrika ve Asya ekonomileri üzerindeki gelişimsel etkilerini değerlendirmek ve tahmin etmek için vaka çalışmaları ve sistemler genelleştirilmiş momentler yöntemi olmak üzere iki yaklaşım kullanır.

İyi altyapı, kurumlar, doğru beceriler ve teknolojiler başarılı sanayileşmeyi belirler. Çoğu Asya ekonomileri bu koşulların birçoğunu karşılarken, Afrikalıların açığı vardır. Bu nedenle, özel sektör rolünün kamu sektörünün rolünün artırılmasında kilit önemde olduğu ve bu boşluğun doldurulmasında önemli olduğu ve dolayısıyla elverişli bir yatırım ortamının yaratılmasının esas olduğu anlamına gelir. Yatırım kurumları ve yatırım ortamının, sanayileşmenin kalkınma etkisi üzerindeki rolünü karşılaştırmak zorunludur. Tez, sanayileşmenin kalkınma üzerindeki etkisinde kurumların ve yatırım ortamının düzenleyici rolünü tahmin ederek, sanayileşme-kalkınma literatürüne katkıda bulunmaktadır. Vaka çalışması sonuçları, Afrika ve Asya ekonomileri arasındaki kalkınma ve sanayileşme farkının eylemci sanayi politikası olduğunu göstermektedir. Asya ekonomileri, Afrika'da durum böyle değilken, ekonomik bağlantıları yüksek endüstrileri hedef alan sanayi politikasını mantıklı ve doğru bir şekilde tasarladı ve uyguladı. Regresyon sonuçları, kurumların ve yatırım ortamının Asya ekonomileri arasındaki sanayileşmenin,

ekonomik kalkınma etkisini yumuşattığını göstermektedir. Afrika ekonomilerinde bu tür kanıtlar eksiktir. Bununla birlikte Afrika, sürdürülebilir kalkınmayı ancak sanayileşme yoluyla ve küresel zorluklarla karşı karşıya kalmasına rağmen eylemci sanayi politikası uygularsa başarabilir. Ancak öncelikle; altyapı, insan becerilerinin geliştirilmesi, güvenilir kurumların inşa edilmesi ve yatırımları çeken, koruyan ve elde tutan politikaların uygulanması gibi temelleri oluşturarak pratik eylemlerde bulunmaları gerekir.



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ABSTRACT

Industrialisation and industrial policy are key vehicles of economic development and they are back on the development agenda drawing attention of academia, policymakers, practitioners and development partners. Industrialisation targeting manufacturing sector is a conduit for technology upgrading, thus stimulate the catch-up effect. Some argue that activist industrial policy underpins successful industrialisation while others suggest that the market spearheads industrialisation. Because quantifying industrialisation and industrial policy success is a difficult task, this thesis uses two approaches, namely case studies and systems generalised method of moments to assess and estimate their developmental effects on selected African and Asian economies. Good infrastructure, institutions, right skills and technologies determine successful industrialisation. Most Asian economies meet many of these conditions while Africans have a deficit. It therefore means private sector role is key in augmenting public sector role and filling this void, thus creating a conducive investment climate is cardinal. It is imperative to compare the role of investment climate and institutions on industrialisation's development impact. The thesis contributes to industrialisation-development literature by estimating the institutions and investment climate moderating role on industrialisation's impact on development. Case study results indicate that the difference in development and industrialisation between African and Asian economies is activist industrial policy. Asian economies properly and judiciously designed and implemented industrial policy targeting industries with high economic linkages while this was not the case in Africa. Regression results indicate that institutions and investment climate moderate industrialisation's economic development impact among Asian economies. Such evidence is missing in African economies. Nonetheless, Africa can only achieve sustainable development through industrialisation and only if they implement activist industrial policy despite facing global

challenges. However, they need to take practical actions by first establishing the fundamentals such as infrastructure, developing human skills, building credible institutions and implementing policies that attract, protect and retain investment.



DEDICATION

This thesis is dedicated to my family, particularly Salome Kunwana (my wife), Providence and Precocious Siyakiya (son and daughter), my mother as well as my father who passed away.



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LIST OF ABBREVIATIONS

AfDB	—	African Development Bank
AMP	—	Automotive Master Plan
BAIC	—	Beijing Automotive Industry Holding Corporation
CAAM	—	China Association of Automobile Manufacturers
DTI	—	Department of Trade and Industry
EGA	—	Emirates Global Aluminium
EOI	—	Export Oriented Industrialisation
EPZs	—	Export Processing Zones
EU	—	European Union
FAW	—	First Automobile Works
FDI	—	Foreign Direct Investment
FEM	—	Fixed Effects Model
GCC	—	Gulf Cooperation Council
GDP	—	Gross Domestic Product
GM	—	General Motors
GMM	—	Generalised Method of Moments
GNP	—	Gross National Product
GVCs	—	Global Value Chains
HDI	—	Human Development Index
ICT	—	Information, Communication and Technology
IMF	—	International Monetary Fund
IMP	—	Industrial Master Plan
IRP	—	Industrial Rationalisation Policy
ISI	—	Import Substitution Industrialisation
ISP	—	Industrial Structure Policy
IV	—	Instrumental Variable
KIC	—	Kigali Innovation City
LCRs	—	Local Content Requirements
LDCs	—	Least Developed Countries
LDV	—	Lagged-Dependent Variable

MDGs	—	Millennium Development Goals
MIT	—	Middle Income Trap
MITI	—	Ministry of International Trade and Industry
MPOC	—	Malaysian Palm Oil Council
MVA	—	Manufacturing Value Added
NEVs	—	New Energy Vehicles
NICs	—	Newly Industrialising Countries
OEM	—	Original Equipment Manufacturers
OICA	—	International Organisation of Motor Vehicle Manufacturers
OLS	—	Ordinary Least Squares
PNEI	—	National Pact for Industrial Emergence
POCPA	—	Palm Oil Credit and Payment Arrangement
POLS	—	Pooled Ordinary Least Squares
PQLI	—	Physical Quality of Life Index
PRSP	—	Poverty Reduction Strategy Papers
R&D	—	Research and Development
SAIC	—	Shanghai Automotive Investment Company
SAP	—	Structural Adjustment Programme
SDGs	—	Sustainable Development Goals
SME	—	Small and Medium Enterprise
SSA	—	Sub-Saharan Africa
UAE	—	United Arab Emirates
UNCTAD	—	United Nations Conference on Trade and Development
UNDP	—	United Nations Development Programme
UNIDO	—	United Nations Industrial Development Organization
USA	—	United States of America
USITC	—	United States International Trade Commission
WDI	—	World Development Indicators
WTO	—	World Trade Organisation

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

For many decades, Africa has suffered development injustice resulting from colonisation, slave trade, political instability due to military coups, liberation and civil wars, and economic reforms (structural adjustment programmes - SAP). While Africa's growth was stagnant, other regions with similar initial conditions, particularly Asia showed substantial progress. Japan with decades of high growth led the development of Asia. This was followed by Asian tigers, China and then the Asian cubs. The success stories of Asia provide a strong case for Africa to establish a strong foundation for building sustained growth.

Africa's underdevelopment cycle is largely divided into three phases. The first one independence era (1950-1980), when most African countries became politically independent. During this period, Africa showed some growth but was momentary. The second phase was the SAPs implementation phase (1980-1990s). Many least developing countries (LDCs) on advice from International Monetary Fund (IMF) and World Bank, implemented vast reforms aimed at economic liberalisation and deregulation. Growth during this phase was mixed. The final phase is implementation of Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs) that is from 2000 to present. In 2000, world leaders of United Nations member states and international organisations adopted eight MDGs to tackle LDCs' development challenges such as poverty, inequality, climate change and hunger among other until 2015. However, not much progress was realised. This was subsequently followed by adoption of 17 SDGs in September 2015, as continuation of MDGs. SDGs endeavour to ensure inclusive and sustainable development, and SDG 9.2 fosters inclusive and sustainable industrialisation. Sub-Saharan Africa (SSA) and other underdeveloped world are not making significant headways on SDG matters.

After many decades of dismal economic performance, Africa is on the global map with six of its countries among 10 economies with fastest growth rates globally in the 1990s and 2000s (Hawksworth & Chan, 2015; Newman et al., 2016). Also, the global financial crisis in 2008 did not relatively affect many African countries because of reserves from natural resources exports, low external capital inflows and little integration and globalisation with the external world.

Africa's growth attracted renewed global interest and raised aspirations of many development analysts to change their narratives and perceptions about the continent. It also prompted a sudden shift in talk from 'African growth tragedy' to 'Africa rising' and 'African lions'. Unfortunately, this growth has not been sustainable and has failed to translate to sustained economic development, as the continent has the highest poverty level and second most inequality rate. Also, the growth has not been job growth enhancing African Development Bank ([AfDB], 2018).

It should not come as a surprise because ample evidence shows that Africa's manufacturing sector is facing premature deindustrialisation and is weak comprising low-value and low-technology involving activities. Africa's manufacturing sector underperformance is attributed to weak infrastructure and institutions, cheap and substandard imported products causing unfair competition, many international commitments (global rules and agreements) and disruption of policy formulation and implementation due to globalisation (Chang et al., 2016). Africa's road to industrialisation is very difficult under these circumstances, thus industrial policy should be context and sector-specific to address these challenges and respond to the region and each country's needs. Industrialisation and development remain elusive to Africa. World manufacturing output statistics¹ shows that Africa's share in world manufacturing in 2015 was 1.8% against 8.9% for Asia and Pacific (China excluded). In 2021, Africa's manufacturing output grew by 5.2% (was the lowest) while Asia and Pacific's increased by 12.7%, and was the highest among all regions. Also, between 2000 and 2019, global manufacturing employment averaged 14% while Eastern and South-Eastern Asia and SSA had the largest and least averages, 18% and 6%² respectively. Literature reveals that prosperity is driven by industrialisation United Nations Industrial Development Organisation ([UNIDO], 2020b).

Africa's growth is owed to primary agricultural products, and mineral and oil reserves, which undergo no or very little upgrading, beneficiation and value addition. Increasing demand for commodities and the rising prices of these commodities underpin this growth. Short-run results show that a rise in commodity prices by 1% increases real GDP by 0.2 to 0.36 percentage points (AfDB, 2018, p. 13). However, the growth is not creating meaningful and productive employment,

¹ <https://xfiles.unido.org/index.php/s/WoSPM9fn2dGEnYw/download>

² [N2010802.pdf \(un.org\)](#)

raising living standards and reducing inequality and poverty in many African countries. Furthermore, this commodity-based growth was affected by falling commodity prices in recent years. Africa has failed to use commodity-based economic growth advantages to slowly establish a strong foundation for industrialisation and structural transformation through diligently applying commodity-based comparative advantage following industrial policies. To reduce this effect, African countries should build capabilities and start advancing industrialisation.

It is well-established that industrialisation (manufacturing) is the panacea to economic prosperity while agriculture, despite being a backbone of many economies, is a source of poverty if not supported by industrialisation (Prebisch, 1959). “All countries that remain poor have been unable to diversify away from agriculture and production of traditional goods into manufacturing and other modern activities,” (Lobsiger & Zahner, 2012, p. 3). Lessons from elsewhere inform that only a handful of economies developed without industrialising manufacturing sector. Throughout history no country developed by overdependence on primary sector particularly agriculture except Australia, Canada and New Zealand (Thirlwall, 1999; Thirlwall & Pacheco-López, 2017). Also, apart from Brunei, Kuwait and Qatar (all which are exceptionally oil-rich countries), Monaco and Liechtenstein (both of which are financial havens), no country attained high and sustained living standards with an underdeveloped manufacturing sector (Chang et al., 2016). For that matter, development is synonymous with industrialisation, so much such that developed economies are industrialised economies while poor economies are also less industrialised or less developed economies.

According to Gerschenkron (1962), LDCs have a backwardness advantage over advanced economies because compared to advanced countries they can copy, adopt and upgrade technology with minimum risk and effort. East Asian economies such as South Korea, Taiwan and recently China, are evidence that backwardness can work to LDCs’ advantage. Unfortunately, backwardness is working against Africa. The Solow growth model predicts that an optimum amount of physical capital accumulation drives growth, and ultimately stirs convergence and catch-up processes (Solow, 1956). While other continents are converging, Africa’s backwardness is exponentially rising. Africa’s development and technology gaps with other regions are exponentially widening. What could be behind these differences? The convergence theory commonly referred as catch-up effect, states that LDCs would eventually converge with developed

ones because their incomes would increase faster than that of rich ones. In addition, Solow growth model states that LDCs would have better access to technological advancements and innovation than developed ones, and these advanced economies would experience diminishing returns to capital. However, majority of LDCs, particularly Africa, are failing to use their backwardness and take advantage of technological developments in advanced economies to catch up. They are also experiencing premature deindustrialisation. Nevertheless, industrialisation remains pivotal to Africa's development.

The growth benefits of catch-up accrue to countries with capabilities to attract capital, participate in global markets and more importantly, absorb new technology (Abramovitz, 1986). Many African economies lack enough of these fundamentals. The lack is caused by policy deficiency (activist industrial policy), weak institutional capacity and under investment in physical and human capital, which characterise many African countries. Given these endemic challenges, African countries need to take considerable actions to change production structure and step-up investments in critical human and physical capital. However, in taking these important steps, government should lead and select which industries or sectors to target. Before taking these steps, government should put in place fundamentals that enable industrialisation and expansion of manufacturing sector through investments in energy, infrastructure and human capital.

Conventional economics suggest that market economic system through competition facilitates economic development by allocating scarce economic resources towards efficient and productive sectors. Thus, they argue that free market should lead the industrialisation process. However, balanced growth theory (Nurkse, 1952) hypothesises that government intervenes with coordinated investments to provide a big push (Rosenstein-Rodan, 1943, 1961) for various related industries at once. The linkages or unbalanced growth model (Hirschman, 1958) argues that government support should only target industries with high and strong linkages with other industries. Besides coordinating interdependent industries, through industrial policy, government can intervene to coordinate competing industries to minimise wastage of resources (Haraguchi et al., 2017). Industrialisation historical evidence from economies in America, Europe and Asia informs that activist industrial policy effected economic development. Without activist industrial policy these economies would not have experienced spectacular developments.

Likewise, African countries should use activist industrial policy by focusing on developing existing industries in the manufacturing sector especially those linked to the primary sector. Thus, Africa can only escape the poverty trap and other development challenges through formulating policies that promote structural transformation, industrialisation and accumulation of capabilities and knowledge necessary to manufacture and export industrial and highly connected commodities. Doing so will create employment, build and diversify technological capabilities necessary for expanding and promoting human capital development and deepening industrial structure. However, this will not be possible and easy without government intervention, strong institutional support and conducive investment environment. Empirical studies stress that institutions and investment have numerous benefits for industrialisation (Oduola et al., 2021). They also catalyse industrialisation and development. However, countries do not automatically or evenly accrue these benefits without establishing certain fundamentals. Also, studies do not reach conclusive evidence and sometimes report conflicting results. Furthermore, institutions and investment's moderating roles on industrialisation's economic development impact is something under-researched. However, these require implementing coherent policies that could potentially drive industrialisation to promote structural transformation for inclusive and broad-based development.

1.2 PROBLEM STATEMENT

Africa performs badly in industrialisation, institutions, investment climate and economic development despite showing exceptional economic growth rates during the past two decades. Africa is no stranger to poverty, with inequality and extreme poverty continuously escalating while other developing regions such as Asia achieved significant poverty reductions. For example, between 1990 and early 2000s, the East Asia and Pacific, and South Asian regions had the largest and second largest numbers of poor people respectively, while SSA had the third largest (Ferreira et al., 2022). What is more, while the population of poor people in the other two regions dramatically fell overtime, SSA's is the largest since 2010, and concurrently is steadily rising. Of the 735 million poor people (living below \$1.90 per day) 416 million are in SSA (World Bank, 2019). The Bank also estimates that Africa will account for 87% of global population in extreme poverty by 2030. With regards to inequality, since 1950, SSA has the highest inequality rate measured by Gini (Ferreira et al., 2022), while according to Seery et al. (2019), Africa has the

second highest inequality rate, and half of the 10 countries with highest inequality rate are Africans (Botswana, Namibia, Nigeria, South Africa and Swaziland).

Furthermore, Africa's exports are still predominantly driven by primary products comprising fossil fuels, mineral ores and forest and unprocessed agricultural commodities (Ajakaiye & Jerome, 2014, p. 4; Martin, 2009, p. 1). About 90% of African (Haiti included) LDCs' merchandise exports are primary commodities (mostly minerals and oil) while 9.4% is just manufactured exports, yet Asian LDCs' exports are 27% and 72% respectively (OECD/WTO, 2019). Africa remains heavily trapped in exporting unprocessed commodities, which are susceptible to price volatility and export earnings fluctuations, thus exacerbating economic shocks (Nkurunziza, 2019). Lack of industrialisation also mean LDCs have limited range of export commodities and export destinations. Moreover, countries that have a high commodity export and/or imports dependence are prevalent to high poverty or low human development. Escaping commodity exports dependence requires adopting new knowledge and investing in human and physical capital with focus on innovation and technology (Busch, 2001, pp. 337-338), hence adopting activist industrial policy is required. An activist industrial policy can mitigate pre-industrialisation deindustrialisation and modulate the pace and path of industrialisation (Tregenna, 2015).

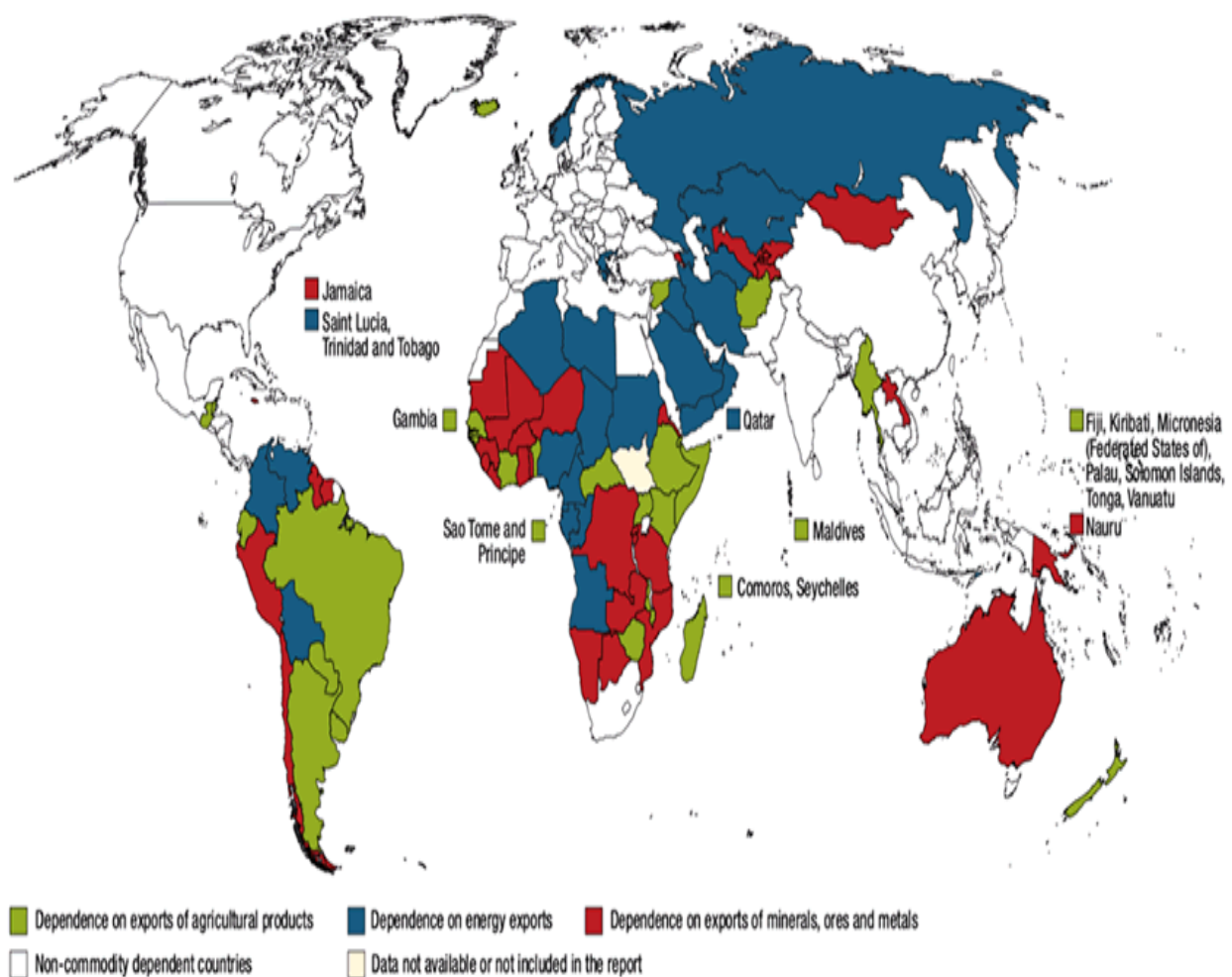
Commodity dependence³ retards human development (Nkurunziza et al., 2017). Underdevelopment and commodity dependence are conceptually and empirically linked (Carcamo, 2019). African, Arab and Latin American countries have a relatively high commodity dependence (see Figure 1.1). More importantly, the more sophisticated are exports of a country the higher its income per capita. Not only does what a country produces matter for exports but for GDP as well. High commodity dependence is the main reason why many developing countries' share of global GDP is very low. As Figure 1.2 illustrates, global GDP reached a \$100 trillion mark in 2022 despite the corona virus pandemic in 2020 and 2021 and the Russia-Ukraine war in 2022. GDP break down is by country and region. Regions with large shares of global GDP are Asia, North America and Europe, while individual countries with large contributions are USA,

³ A country is considered commodity dependence if its exports are constituted by commodities ranges from 60% and above (Carcamo, 2019, p. 3). It measures the ratio of commodity exports from merchandise exports.

China, Japan, Germany, etc. The 12 economies with largest contributions have sophisticated manufacturing sectors and produce at least one local vehicle brand as well. Africa's contribution is very minuscule, thanks to lack of industrialisation.

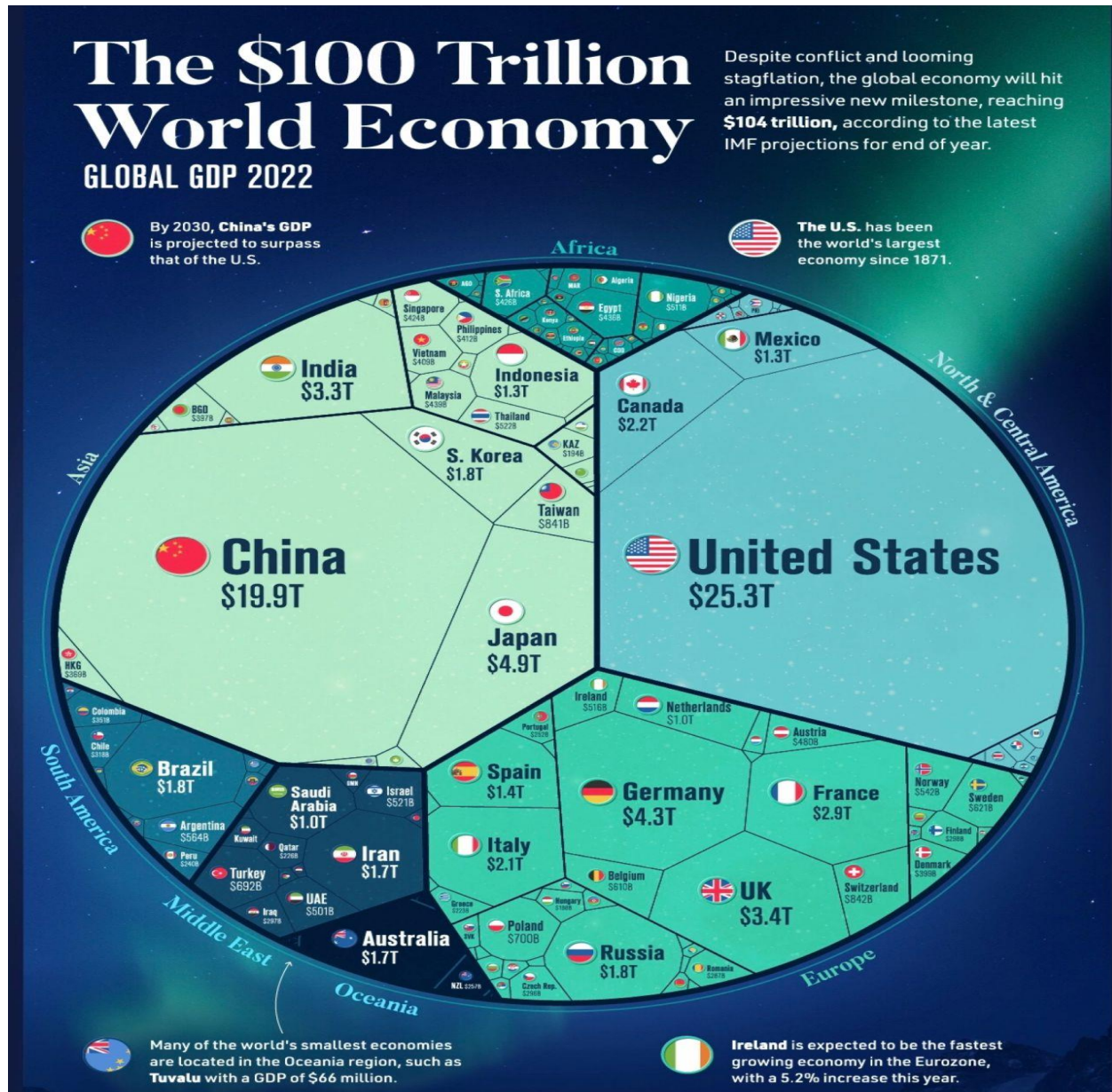
Some LDCs in East Asians realised that producing and exporting more sophisticated products result in higher economic dividends. They changed the narrative by emphasising on government intervention and proactive industrial policy. Surprisingly, Africa's growth is primary commodity-based, yet empirical literature (Chenery et al., 1986; Kaldor, 1957, 1966) posits that sustained economic growth is based on vibrant manufacturing sector (engine of growth hypothesis).

Figure 1.1: Commodity Dependence Map, 2021



Source: Laurent (2021).

Figure 1.2: World GDP by Region and Country, 2022



Source: <https://www.visualcapitalist.com/wp-content/uploads/2022/07/100-trillion-global-economy-gdp-full-size.html>

However, there is hope that Africa can industrialise and catch up with advanced economies. The low hanging fruit for Africa to start the industrialisation process is by capitalising on its natural resources abundance and use them to promote economic and structural transformation through nurturing promising infant industries, value addition and beneficiation. Just relying on selling basic commodities cannot sustain economic growth and development. This

is not easy because value addition and beneficiation by developing economies means competing for market share and global revenue with developed economies, thus there is always resistance from advanced economies. Nevertheless, the developing economies have no choice but to fight it because this is a fight for development to sustain the fabrics of economic survival. East Asian experiences show that these were possible through designing and implementation of coherent and judicious activist industrial policy, where government was the actor or enabler and facilitator of the industrialisation process.

Africa has been at a crossroads for a long time without tasting meaningful development. The level of industrialisation in Africa falls short of creating more and decent jobs as well as reducing inequality and poverty. Broadly speaking, Africa's development challenges are linked to lack of industrialisation. Thus, industrialisation is vital to solving most of Africa's problems. However, Africa has to first address certain fundamentals that are pertinent to industrialisation. The first priority is to invest in productive infrastructure (power, transport system and water) and human capital. According to AfDB (2018), Africa has an infrastructure deficit of between US\$130 and US\$170 billion per annum, yet domestic revenue mobilisation is inadequate to fill this infrastructure gap, thus US\$68 to US\$108 billion has to be mobilised externally to close the financing gap. The huge infrastructure gap calls for private capital investments to fill this void, thus a conducive investment climate is cardinal to attract external funding. The low levels of infrastructure development, human capital and poor investment climate explain much of Africa's low industrialisation. A second is to encourage economic transformation from low capital-intensive and low-skilled labour activities to high capital-intensive and high-skilled labour activities.

Given experiences elsewhere, particularly Asia, there is one clear choice African leaders can follow in order to change economic structure, create decent jobs, reduce endemic poverty and inequality and solve other development challenges. One such path is to promote industrialisation, strengthen institutional capacity and create a conducive investment environment. These require adoption of judicious activist industrial policy, whose success also requires governments' willingness to establish effective institutional arrangements that are able to deal with complex issues of industrial policy designing, planning, implementation and coordination.

1.3 OBJECTIVES AND HYPOTHESIS

This thesis seeks to explore two broad areas. Through case studies, it investigates extensively how selected countries in Africa and Asia design, formulate and implement industrial policy in various sectors. The thesis hypothesises that implementing activist industrial policy leads to industrialisation and economic development. It tries to answer the following questions; how each economy achieved or is trying to achieve economic transformation given its endowments, and how infrastructure (hard and soft), policies and institutions and capabilities, accumulation of knowledge and learning facilitated industrial development process and structural transformation. Since Asian economies fair better than African economies in implementing industrial policy, the case studies explore development lessons for African countries.

Secondly, the thesis seeks to comparatively examine the economic development contributions of industrialisation, investment and institutional quality in selected African and Asian countries. In doing so, it further explores the moderator roles of investment climate and institutional quality on industrialisation's impact on economic development. However, higher industrialisation and ultimately economic development can be realised through improvements in institutions and investment climate. Interacting variables takes into account high and low values of moderating variables, which are not captured by simple regressions.

Finally, the study offers policy recommendations for African policymakers and development partners to consider and implement policies that stimulate industrialisation and improve the institutional and investment environment for purposes of enhancing economic development not only in Africa but in other developing countries.

1.4 METHODOLOGY AND SCOPE

We use both qualitative (case studies) and quantitative (econometric model) to avoid relying on one approach which may lead to misleading results and conclusions, thus making false policy recommendations. Qualitative research facilitates refined conceptualisation and discovery of new and better explanatory concepts, and it liberates from overreliance on previous ways of thinking regarding specific research problems (Fry et al., 1981). It deals with practical issues and also helps to explain factors or evaluate variables that are difficult to measure. Also, the

institutional and industrial policy roles in economic development are important but sometimes very difficult to quantify.

Contrariwise, quantitative approach is representative and reliable. Regression equations in particular can also be a useful vehicle to inquire into complexity such as moderation effects. Nevertheless, without proper due diligence quantitative approach can be affected by endogeneity, omitted variables, misspecification error and other biases. Combining the two approaches enhances validity of results and quality of research because no single approach is inherently more superior. It strengthens causal inference (Fearon & Laitin, 2011), enhances data quality, policy analysis and depth of understanding (Hulme, 2007) and enriches the contextual basis to test, interpret and validate results and research methodology (Kaplan & Duchon, 1988). It also offers excellent ways to analyse economic development progress and offers possibilities to improve methodologies to analyse research. Nevertheless, combining methods can lead to complications and confusion (McEvoy & Richards, 2006).

We use case study method to answers questions of how and why nature in describing structure and life cycle of economies and industries and to deal with difficult to control behavioural events (Yin, 2014). Econometric model is more suitable for building theory and testing hypothesis. The case study method compares industrial policy implementation, success and challenges in industries or sectors in four African and eight Asian economies while the econometric approach analyses the complementary role of institutional quality and investment on industrialisation's economic development impact on 26 African and 26 Asian economies from 1995 to 2018. Nevertheless, the industrialisation benefits to economic development can be realised when industrial development is sustainable and inclusive (UNIDO, 2017b).

1.5 STUDY JUSTIFICATION

Despite recent growth spurts, Africa has the lowest human development index (HDI) and highest inequality and poverty rates. It lags in industrial, physical infrastructure, technological and human capital developments, export quality and product sophistication. Nevertheless, East Asian's industrial policy experiences demonstrate that industrialisation has positive developmental benefits such as achieving sustainable and inclusive growth and reducing poverty and inequality. Surprisingly, some African countries have industrial policy documents, but lack institutional

capacity and investment support to implement them. However, having industrial policy on paper without proper implementation is like heading to war with guns without bullets.

Similarly, Africa needs to implement activist industrial policy to attain industrial development. Thus, policymakers and development practitioners can use selective industrial policy to spearhead industrialisation and economic transformation so that Africa can reduce its development gap with other regions. Lack of industrialisation reinforces Africa's poverty, inequality and other developmental challenges. It presents difficulties for Africa to create opportunities for all, produce quality exports, sustain economic growth, reduce poverty and inequality, create employment and sustainable and inclusive development.

Industrialisation does not only directly improve economic growth and human development, but also contributes both directly and indirectly to SDGs attainment. Industrialisation is positively related to economic development (HDI) and SDG index (UNIDO, 2020b). Higher industrialisation or manufacturing levels may achieve more than two-thirds of SDGs. Similarly, economies with faster industrialisation and structural transformation are also making significant progress to SDGs attainment. SDG 9 covers industrialisation, innovation and infrastructure, meaning that innovation and infrastructure are the pillars of industrialisation. SDG 9 cuts across other SDGs, and contributes to SDGs 1, 2, 3, 5, 6, 7, 8, 10, 11 and 12 (UNIDO, 2017a, 2020a, 2020b). Industrialisation is becoming increasingly more important than ever due to the need to achieve SDGs and 2030 Agenda.

Without industrialisation Africa's prospects to achieve SDGs and Agenda 2063 are increasingly diminishing. Industrialisation can turn-around Africa's development conundrums, and this thesis actually adds value to that thinking process. Africa should reallocate economic resources to high productivity sectors from low productivity ones so that growth can be sustainable, thus making it possible to converge to higher income status. Consequently, African economies can only overcome development challenges through industrialisation. African policymakers should think seriously about designing and implementing activist industrial policy by focusing on upgrading products, promoting and developing sectors with high-productivity and technology-intensity, particularly manufacturing sector but also other technology-based sectors.

Having critically evaluated Africa's development challenges vis-à-vis Asia's successful in this chapter. Chapter 2 discusses the concepts of economic development, industrialisation, industrial policy, institutions and investment. It reviews literature on each of these concepts with economic development as well as their significance to development. Furthermore, the chapter discusses the role of state and market in promoting industrialisation and development. Chapter 3 compares industrial policy experiences in selected industries and sectors in Asian and African economies. Comparison of industries is not just limited to manufacturing sector (automobile, aluminium, electrical and electronics and semiconductors) but also includes primary sector (apparel and garment and leather and textile) and services sector (information, communication and technology (ICT)). The chapter demonstrates that activist industrial policy contributed to the successful industrialisation and development of most Asian economies while lack of basic conditions (infrastructure, human skills, technology capabilities) and government support are behind African economies' underdevelopment. Asian governments helped firms through carrots and sticks to develop technological capabilities and to compete internationally.

While Chapter 3 uses case studies to capture mostly the qualitative aspect of industrialisation and industrial policy on economic development, Chapter 4 uses regression to capture the quantitative aspect. It econometrically examines industrialisation, institutions and investment's contributions to economic development. The chapter also examines if institutions and investment play a moderating role to industrialisation's economic development impact in selected African and Asian economies. The thesis concludes with a summary and policy recommendations based on results and findings.

CHAPTER 2

DEVELOPMENT IMPLICATIONS OF INDUSTRIALISATION, INSTITUTIONAL QUALITY AND INVESTMENT CLIMATE: A REVIEW OF THEORETICAL AND EMPIRICAL LITERATURE

2.1 INTRODUCTION

It is a fact that higher economic development is achieved through industrialisation. Advanced countries' economic development is highly linked with their ability to increase productivity levels. Nevertheless, different sectors' contributions to overall economic development vary considerably across countries. Moreover, the institutional and investment environments under which sectors operate posit variations in economic development. Thus, achieving sustained economic growth entails reallocation of productive resources from primary to secondary sector making industrialisation a fundamental force for structural transformation and development process. A sizeable body of empirical and theoretical literature stress the centrality of industrialisation, industrial policy and implementation of proper institutions and investment polices to stimulate economic development.

These are essential for developing countries to catch up and close the productivity and development gaps with advanced economies. Nevertheless, debate on whose responsibility (market or state) is to drive and implement these has been ongoing for several decades. This chapter starts with definitions and measurement of terms and then reviews theoretical and empirical literature regarding importance of industrialisation (manufacturing sector), institutions and investment climate on economic performance. The terms economic development, industrialisation, industrial policy, institutions and investment climate may have different meanings; thus, it is imperative to begin by making definitions and having commonly agreed calculations and measurements of these terms where possible.

2.2 CONCEPT OF ECONOMIC DEVELOPMENT

The major objectives of many countries are to realise high level of economic development or growth. Surprisingly, these two terms are sometimes used interchangeably, yet their meanings are not the same. Perkins et al. (2013, p. 24) highlight that economic growth acts as a means to

achieve high economic development. Although growth is an essential component of economic development, literature finds it to be an insufficient measure of development (Nafziger, 2012, p. 14). Schumpeter (1983, p. 19) stresses that mere quantitative growth is not a reflection of development, but economic development should mean sustained and inclusive growth resulting in an upward movement of national income, population and savings. Economic growth is not a guarantee of economic development (human progress), nevertheless growth leading to equitable distribution of wealth and income is desirable and is an effective pathway to sustainable development (UNDP, 2019, p. 3). Sustained economic growth involves structural transformation from agricultural to manufacturing sector (Elhiraika, 2008; Henn et al., 2013). Ki-moon (2012) in his observations suggests a move beyond GDP as a measure of welfare and calls for development of indices that prioritise people because GDP or GNP are misleading development indicators.

Beyond just expanding a country's income and wealth, development should also focus on expanding people's choices, well-beings and capabilities. According to Seers (1969, pp. 3-4), economic growth alone is insufficient and probably socially damaging. Rising growth or income without addressing inequality, poverty or/and unemployment retards development. Thus, it is not a proper indicator of human welfare since if not properly managed can have undesirable growth effects like jobless, ruthless, voiceless, rootless and futureless (Fioramonti, 2019; UNDP, 1996). Henceforth, using economic growth to indicate well-being can lead to misleading or incorrect policy decisions (Aitken, 2019, p. R4). In that regard, it is very imperative at the inception to differentiate the two concepts.

Economic growth involves increments in income per capita or production whereas economic development involves economic growth that encompasses changes in economic structure and output distribution (Nafziger, 2012, p. 14). These changes may comprise improvement of livelihoods of the most vulnerable and poor population, improvement in education and labour force skills, rising extensive technical progress and shares of non-agricultural sectors such as industry and service, and declining share of agriculture sector from gross national product (GNP). Economic growth involves increments in inflation-adjusted or real income per capita or change in national income (Perkins et al., 2013, p. 23). It measures economic production (Roland, 2016, p. 82).

GDP and GNP are widely used to define, calculate and measure economic growth. Both measure the final output produced in a country's economic territory by residents and non-residents, and final domestic and foreign output produced or created by a country's residents respectively (Perkins et al., 2013, p. 24; Todaro & Smith, 2015, p. 16&17). However, GDP inappropriately and unreliably measures welfare due to unwittingly concealing inequality in society (Kuznets, 1962, p. 29). The conventional measurements of economic growth do not include costs related to externalities like pollution, environmental degradation, resource depletion, etc. in their computations (Ray, 1998, p. 27). GDP is mainly concerned with monetary value of output but neglects outcomes from economic activities such as people's well-being (Gadrey, 2004). It also disregards value of activities carried out under the classification of household production, voluntary work and public administration (Vaury, 2007). Besides not being a good indicator of progress, Stiglitz (2014) also stresses that it fails to measure how well an economy performs. It ignores all activities that takes place outside the realm of monetised transactions despite their importance to well-being (Talberth et al., 2007, p. 2). Furthermore, there are certain important economic activities performed under volunteering or within the household sectors that usually go unnoticed.

In contrast, high economic or human development⁴ is an enabler of economic growth because investments in human and physical capital, particularly education and healthcare, improve labour productivity and innovation, which in turn spur growth. Economic development encompasses a process of structural change towards diversification and engagement in high value-added activities. And according to Roland (2016, p. 82), it includes improvements in people's standards of living and their well-being or quality of life. It goes beyond growth and its concerns are not just for the richness of an economy in which people live, but the richness of the human life. Specialising in producing and/or exporting consumer goods without diversifying to manufactured commodities leads to economic growth that will not translate into economic development (Simandan, 2009, p. 422). Economic development has varying meanings depending on the field and branch of economics (Deaton, 2010, p. 3). It is a concept that is not solely limited to or explained in economic terms and measured by economic indicators. Moreover, it is a normative

⁴ Human development is synonymous with economic development and in this text we sometimes use the two interchangeably.

concept that is not easily captured by only one index or measure. Hence, it is critical to have an understanding of the factors (economic and non-economic) and dynamics of economic development, and how these interplay (Szirmai & Verspagen, 2015). Economic development entails a radical transformation in the organisation of economic activities (industrialisation), ways of doing things (change of behaviour, customs or even beliefs) and institutional, political and social structures in a country.

Economic development should be understood as a process that enlarges people's choices and leads to improved healthy and knowledge acquiring status, and increased access to resource and opportunities (Perkins et al., 2013, p. 41). According to Amsden (2001, p. 2) it involves a situation where the exploitation of assets and transformation of primary products is done by unskilled labour to a scenario where knowledge based assets are exploited by skilled labour. The movement involves attracting human and physical capital from agriculture and mining to manufacturing sector, which is regarded as the heart of economic growth.

Economic development is broadly measured by two basic indices; physical quality of life index (PQLI) and HDI (Cypher & Dietz, 1997; Nafziger, 2012). PQLI is constructed from a set of three components, which are infant mortality, life expectancy and literacy rate. Nevertheless, PQLI is less reliable since its measurement is arbitrary and some of its components are highly correlated with income. HDI is however a combined index calculated from three indicators; longevity (healthy and long life), educational attainment (knowledge) and living standards (per capita GDP at purchasing power parity) UNDP (2018, p. 1). Despite being a better indicator than PQLI, HDI does not capture gender discrepancies on social progress. For a detail explanation on how HDI is constructed readers can see Cypher and Dietz (1997, p. 63); Nafziger (2012, p. 34) and UNDP's website⁵.

2.3 CONCEPT OF INDUSTRIALISATION AND INDUSTRIAL POLICY

The panacea to high economic development, living standards and global competitiveness is industrialisation. Owing to low industrialisation, unsurprisingly there is persistent poverty in many LDCs. This also makes the poverty penalty relating to costs of logistic, production, trade

⁵ http://hdr.undp.org/sites/default/files/hdr2019_technical_notes.pdf

and accessing other services to be higher in LDCs than in rich ones. Rich countries continue to be rich thanks to technological advancements and innovation targeting manufacturing activities or industries while poor countries face the opposite (Reinert, 2007). Simply put, rich countries specialise in or have comparative advantage in man-made commodities while poor countries specialise in or have comparative advantage in nature-made commodities. Furthermore, the degree of economic structure separates advanced economies from LDCs (Felipe et al., 2010). In rich countries, industrialisation enables production and exportation of commodities that are highly sophisticated and highly connected to other products. What countries choose to produce is what causes, determines and results in whether they can prosper or not. Economic development entails active learning, building capability and innovation (Dutrénit et al., 2013). The industrial, productivity and technology gaps separating Africa and other continents are widening and becoming deeper than before, thus negatively affecting economic development. However, Africa's challenges are not only confined to weak institutions and less productive techniques of performing economic activities and doing business, but also in the inability to expedite the industrialisation and structural transformation process in her traditional low productivity activities such as agriculture, mining, etc., and embrace competitive, high value, knowledge-intensive and skilled activities.

Private sector undoubtedly drives industrialisation and structural transformation. Nevertheless, it requires government guidance and intervention through correcting distortions resulting from market failures and designing, setting the pace and implementing policy frameworks that foster economic development, innovation, structural and technological change. That is, government can support certain activities that may not have immediate dividends to many investors but have the potential to trigger multiple backward and forward economic linkages and positive spillovers in the future. Through a well-designed and implemented industrial policy, government can also coordinate and promote new economic activities that may fail due to coordination failures, information asymmetries and absence of complementary activities. Government intervention is useful because it promotes and accelerates industrialisation and structural transformation towards more competitive, dynamic, productive and high value activities.

2.3.1 Importance of Industrialisation

Industrialisation encompasses a shift from low value activities like agriculture to high and modern sectors such as manufacturing and services (Biernacki, 2001; Cornwall, 1977; Felipe et al., 2010; Kuznets, 1955), and it is an important process for sustainable development (O'Brien, 2001). “Industrialisation refers to an increase in the share of GDP contributed by the manufacturing sector. It is a process that involves a change in the structure, or make-up of the economy,” Chandra (1992, p. 4). O'Brien (2001, p. 7360) defines industrialisation “as a socioeconomic process with a rapid transformation in the significance of manufacturing activity in relation to all other forms of production and work undertaken within a national or local economy.” According to Simandan (2009, p. 419) “it is a generic name for a set of economic and social processes related to the discovery of more efficient ways for the creation of value.” And according to Weiss (2010, p. 2), “it is the process under which manufacturing sector comes to play a significant role in total activity of an economy.” Industrialisation goes beyond economics but is a societal transformation, which also encompasses cultural, political and social changes (Biernacki, 2001; Chandra, 1992; O'Brien, 2001).

To succeed in industrialisation, production and management systems need to be adjusted to cope with global competition. Thus, production structures should involve more usage of capital-intensive techniques and innovation and technology and a total change in attitude, culture and the way of thinking and doing things. Through industrialisation, manufacturing sector undergoes a structural transformational process that involves shifting labour and other factors of production from less productive sectors of the economy to the more productive ones (Syrquin, 1988; Szirmai, 2012). Compared to developed countries, low transformation in LDCs is due to weak linkages between low and high productivity economic activities, and low productivity activities constitute the bulk of economic activities in LDCs. Also, weak linkages between economic activities have affected developing countries' ability to create high quality jobs in secondary and tertiary sectors (Ács & Naudé, 2013).

Two indicators are generally used as measurements of industrialisation. These are manufacturing sector's share of value added within the whole economy's value at constant prices (MVA) and manufacturing sector's the share of employment in total employment (Chandra, 1992).

MVA is associated with technology and innovation and is relatively high in developed countries whilst employment is directly linked to inclusive development and employment creation and is relatively high in LDCs. However, LDCs need MVA to catch up.

Three propositions by Nicholas Kaldor substantiate manufacturing sector's economic centrality. Firstly, manufacturing sector growth is highly linked to GDP growth (manufacturing sector growth determines GDP growth). Secondly, manufacturing sector productivity is related to manufacturing sector growth (high productive in manufacturing sector leads to high growth of other sectors). Thirdly, manufacturing sector growth is greatly linked to productivity and other sectors' growth. Ács and Naudé (2013) also argues that manufacturing sector offers more opportunities for accumulation of capital and economies of scale than agricultural or service sectors. In addition, Engel's Law posits that high income increases demand for manufacturing products while low income increases demand for agriculture products. That is, compared to agriculture, manufacturing has higher price and income elasticity. Nevertheless, agricultural and service sectors are still relevant, and should not be ignored. Thus, industrialisation should not necessarily target manufacturing and industrial sectors, but should also target non-agricultural and high-value service sectors and activities for example tourism and software development (Altenburg, 2011, p. 11). However, with time and adoption of appropriate technology industrialisation should gradually extend to manufacturing and industrial sectors. A summary of arguments for and benefits of structural transformation and industrialisation in general and on economic development in particular are clearly summarised in Szirmai and Verspagen (2015).

Baumol (1967) and Baumol et al. (1985) disagree with the notion of servicification because it makes an economy to undergo cost disease or structural burden hypothesis due to labour that could move from sectors that are high productive to ones that are low productive. Moreover in comparison to industrial-led growth, services-led growth does not deliver more rapid growth (Rodrik, 2014). However, other studies see services sector more important than manufacturing (Acevedo et al., 2009; Dasgupta & Singh, 2007; Ghani & O'Connell, 2014). Tregenna (2015) emphasises that only under exceptional cases⁶ can services play a more dynamic and prominent role like manufacturing. Technological and innovation diffusions to agriculture and service sectors

⁶ The service sectors in this case should closely interact with sophisticated manufacturing activities.

as well as their mechanisation and modernisation all originated from manufacturing sector (Haraguchi et al., 2017). Manufacturing has a pull effect on other sectors by promoting private sector investment and savings and accelerating accumulation of technology through incremental technological capability acquisition and technical change (Su & Yao, 2017). It also has a growth-pulling effect that enables LDCs to transition past MIT. It is undoubtedly the only sector with high demand for capital and investment, and which provides more opportunities for private sector savings and capital accumulation (Ghebresus & Luzze, 2019).

Low industrialisation leads to low economic diversification in producing and exporting high-technology manufactured products, thus limiting a country's global competitive advantage. This exposes LDCs to premature deindustrialisation and external financial and trade shocks. Furtado (1976) also emphasises that industrialisation makes LDCs less dependent on advanced countries. Lack of industrialisation makes many LDCs accept decisions that sometimes compromise sovereignty or do not matter to national interest. In order to foster economic development, it is high time LDCs should reconsider industrialisation and manufacturing sector.

Manufacturing sector is capital intensity, drives technological change and creates many opportunities to make profit from the exchange of technology and innovation in the global market, thus it is the locus of technological progress (Chenery et al., 1986; Cornwall, 1977; Kaldor, 1966). Activities such as travelling, communication, health, etc. that people normally do in their daily lives are possible because of technological and innovation breakthroughs in manufacturing sector. All technological breakthroughs in electronics, machines and medicines are possible because of manufacturing. Many countries have labour and raw materials; however, they lack capital and technology. The two factors shape, define and differentiate the development process countries (Hoffmann, 1958, p. 23). The sector has spill overs and stronger linkages with rest of the economy than any other sector (Herzer, 2007; Lavopa & Szirmai, 2012). It also creates complementarities with other sectors (Cornwall, 1977; Hirschman, 1958; Rosenstein-Rodan, 1943). Amsden (2001, p. 2) states, "industrialisation is in the manufacturing sector that knowledge-based assets have been nurtured and most intensively used." Unlike agricultural commodities, manufactured commodities are more profitable since they are internationally tradable and less susceptible to price shocks (Kaltenberg & Verspagen, 2015).

2.3.2 Importance of Industrial Policy

It is very unlikely to talk about industrialisation without looking or also talking about industrial policy. Nearly all successful stories of industrialisation and structural transformation involved manufacturing sector and led to sustained and sustainable economic growth and were too accompanied by industrial policies and extensive government support (Yülek, 2018). However, industrial policy and government intervention have been subjects of great contention in economics in general and development economics in particular. If improperly implemented and managed, industrial policy can create rent-seeking behaviours and reward inefficient firms and individuals. These reasons are cited by neoclassical economists in their advocacy and defence against generous and selective industrial policies targeting certain industries or sectors. Nonetheless, economic theory and experiences provide enough justification for government intervention and industrial policy. In addition, with growing economic crisis, unemployment, competitive challenges and structural imbalances, and pressure to stimulate and strengthen economic growth, state intervention and industrial policy are back on the policy menus of many countries.

Even governments that advocate publicly for free market system and are sceptical about activist industrial policy, provide life-lines through bail-outs, tax deferrals, credits and fiscal stimulus packages to certain companies, firms and industries amid economic, financial crisis, recessions and the corona virus pandemic. Britain, USA, Germany and other European countries crafted various policy reforms to protect the too-big-to-fail companies which are strategic to the economy and minimise the economic contagion shocks of the 2008 global financial crisis (Andreoni, 2017; Bermeo & Pontusson, 2012). The European Union (EU) in 2019, 2020 and 2021 also asserted to implement activist industrial policies that boost global industrial powerhouse in the face of increasing industrial competition from China and COVID-19 pandemic by focusing on long-term technological developments (Terzi et al., 2022). Because of the devastating effects of the pandemic on industrialisation and social welfare, in 2020, global GDP fell by 3.3%, 255 million people lost their jobs and a further 97 million people around the world were pushed into poverty (UNIDO, 2021). The pandemic had markedly different effects across countries, industries and firms, but despite its devastating condition, other countries performed well, thanks to less severity of the pandemic, better COVID-19 containment measures, income levels, industrial capabilities, productive structures and size of government support and domestic markets (ibid). Countries with

a strong and vibrant industrial capability were able to mitigate the COVID-19 pandemic's devastating effects because the industrial capabilities enhances a country's manufacturing sector ability to produce essential and strategic commodities and the manufacturing sector is the engine of growth and development (ibid). LDCs' support for industrialisation because much of their budget was earmarked for social support and welfare of citizens. Crises generally threaten economic growth and human development, but they can facilitate structural change. Some governments take advantage of crisis to turn-around policies and politics through funding and stir their economies in new directions. Nevertheless, government's capacity to intervene during a crisis depends on its funding ability and extent of economic damage. According to Martin (2009, p. 673) economic progression and recovery take various shapes in the aftermath of a shock; V-shape (economy rebounds to its pre-crisis path), W-shape (swings several times), U-shape (recovers but not to its pre-crisis track) or L-shape (economic growth declines and never rebounds to its pre-crisis path).

Prominent development economists including Albert Hirschman, Alexander Gerschenkron, Paul Rosenstein-Rodan and Raul Prebisch advocate for state intervention. They argue that unlike free market system, the state shapes and directs economic activities for long-term development and societal benefit. Capitalism influenced development policy to shift from state intervention towards free market system. The state's developmental role became limited because it was believed to promote inefficiency and discourage competition. Also, empirical and theoretical literature reveal that catching up experiences by Germany, Japan, USA, Asian Tigers and China were not through following the Washington Consensus. These countries adopted active industrial policy, and their governments directed industrial development and structural transformation towards high-value-added and high technology manufactured products. Consequently, they made several strides to achieve high economic development and growth, reduce poverty and advance technological upgrading (Altenburg, 2011). Catching up is possible if the state channels resources towards high-value manufactured products and promising industries, encourages new and better ways of doing business and proactively inspires structural transformation (Altenburg, 2011; Chang, 2002). The success of latecomers was not through comparative advantage, globalisation and free trade, but through imitation in producing manufactured products that equal or excel those of pioneers (Reinert, 2007).

Economic transformation and industrial policy literature highlights that achieving sustained economic development and growth is possible through industrial development and changing economic structure towards productive, competitive and high value activities. The literature also pinpoints that industrial structure upgrading as well as economic diversification are the cornerstones of development and growth. However, realising these is possible when certain fundamentals are done. These include; industrial policy management capability⁷ (Altenburg, 2011), learning society, capabilities, knowledge accumulation and learning new technologies (Jomo & von Arnim, 2012; Khan & Blankenburg, 2009; Stiglitz, 2014), comparative advantage and exploitation of factor endowments (Lobsiger & Zahner, 2012), adoption of pragmatic policies that withstand globalisation (Ohno, 2013), compensation of pioneer firms for their innovation and information externalities (Rodrik, 2007) and ability to learn and advance technological progress (Stiglitz, 1987).

No commonly agreed upon single definition of industrial policy. The various definitions explain industrial policy as a government measure, or a set of policy measures that aim at promoting structural transformation. Industrial policy; *“is basically any type of selective intervention or government policy that attempts to alter sectoral structure of production toward sectors that are expected to offer better prospects for economic growth that would occur in the absence of such intervention, i.e., in the market equilibrium, (Pack & Saggi, 2006, p. 2).”* Warwick (2013, p. 16) defines it as, *“**any type of intervention** or government policy that attempts **to improve the business environment** or to alter the structure of **economic activity** toward sectors, **technologies or tasks** that are expected to offer better prospects for economic growth **or societal welfare** than would occur in the absence of such intervention.”*

According to Stanford (2008, p. 280), industrial policy refers to *“measures aimed at improving the sectoral mix of an economy, ensuring that a region or country has a strong set of base industries that allow it to compete successfully in global trade, and support non-tradable spin-offs.”* Haraguchi et al. (2017, p. 28) also states that, *“it is any policy that affects the evolution of industry; especially of the manufacturing sector.”* Noman and Stiglitz (2017, p. 1) refer it to

⁷ *“Is the ability of political leadership to influence structural change in a way that improves the competitive performance of the economy sustainably,” (Altenburg, 2011, p. 21).*

“public policy measures aimed at influencing the allocation and accumulation of resources, and the choice of technologies.” Industrial policy used to focus only on promoting manufacturing sector, however, according to Cornia and Vos (2013) it covers even , non-agricultural and high-value services sectors as well as modern activities. Nevertheless, there are inconclusive arguments on what form an industrial policy should take. What is more, for industrial policy to lead to effective economic and industrial transformation proper designing and targeting of the sectors or industries is key.

Like industrialisation, the scope and focus of industrial policy is no longer limited only to manufacturing and industrial sectors, but encompasses other high value-added economic activities in the agriculture, mining and knowledge-based production services sectors (Altenburg, 2011; Cornia & Vos, 2013). Therefore, LDCs can use industrial policy as a strategy to achieve high economic development through supporting manufacturing sector growth. However, the success of any industrial policy process lies with the political leadership and government who champion and steer the policy direction through coordination, monitoring, overseeing and making those involved accountable to their actions (Rodrik, 2004). Ohno (2009) buttresses Rodrik (2004) by stressing that industrial policy success requires visionary political leadership that ensures no resistance of reforms by groups with vested interests. He further argues that top political leadership is decisive and plays an initiative role to kick-start industrialisation and structural transformation processes by gradually improving the learning environment. Government intervenes to shape industrial policy direction by regulating or facilitating certain activities, directly participating in economic activities as producer or consumer and financing or investing in strategic or innovative projects that are risky for private financiers (Peres & Primi, 2009).

Industrial policy literature (Warwick, 2013; Weiss, 2016) emphasises that industrial policy⁸ can take two forms, that is, functional and selective or horizontal and vertical. Horizontal or functional industrial policies are ones that seek to improve the economic business or market environment across all sectors. They are naturally least interfering and too broad in their nature,

⁸ Other scholars use different jargon to differentiate functional or horizontal from selective or vertical industrial policies. For example Harrison and Rodríguez-Clare (2010) (soft and hard), Stiglitz (2005) (pro-market and pro-business) and Weiss (2013) (market-based and promotional).

and are designed mainly to promote business or market operations. They encompass policy measures that remove barriers to entry for firms or liberalise trade. However, functional and horizontal industrial policies can be further categorised into two distinctive policies (Lall & Teubal, 1998). Horizontal industrial policy is less general and is intended to promote particular activities across sectors while functional is more general and their aim is to improve the operations of the markets. Nevertheless, both can be selective because even in their general form they still favour certain sectors over others (Altenburg, 2011; Hausmann et al., 2008; Salazar-Xirinachs et al., 2014). Since LDCs demand many resources to implement industrial policy, they find it hard to manage general industrial policies hence the selective one is more suitable for them. Nevertheless, resources injected in dribs and drabs may not make meaningful contribution to selective industrial policy implementation.

The aim of selective or vertical industrial policy is promote specific or targeted at sectors or industries. Here the state systematic in a preferential manner intervenes to support or protect certain sectors or industries over others. The state can subsidise firms in a particular sector or industry, put restrictions, import tariffs and tax or give tax exemptions, incentives or holidays to certain raw materials in certain sectors or industries. Sizeable development economists (Amsden, 1989; Khan & Blankenburg, 2009; Lall, 2004; Lin & Chang, 2009; Wade, 1990) emphasise that successful latecomer industrialisers heavily adopted selective industrial policies by using financial and non-financial support to industries of strategic importance and with potential to create strong economic linkages. While selective industrial policy is behind the success of today's advanced countries and lately of newly industrialising Asian economies, in many LDCs it is otherwise because state resources are directed towards inefficient areas, bureaucrats engage in corrupt and rent-seeking activities, and investors are generally discouraged from taking risk due to the state's arbitrary interference in business.

Selective industrial policy is further divided into picking winners or creating winners, comparative-advantage-complying or comparative-advantage-defying, and leading the market or following the market. Picking winners is cherry picking certain firms and granting them special treatment like offering subsidies and market production. The strategy can be successful if state has embedded autonomy and can work closely with private firms benefiting support. Otherwise, it can create rent-seeking behaviours and corruption. Picking winners is more appropriate in developed

economies than in LDCs because there are already winners to pick. Thus governments of LDCs have to start from scratch and create the winners through selective support programmes as opposed to general support (Wade, 1990). As for creating winners, government creates its winners through state-owned enterprises because private firms are not able and willing to enter new markets that involve high-technology for instance in the aviation industry⁹ (Vértesy, 2011, p. 135). In LDCs selective industrial policies are more suitable under creating winners than picking winners, but it is up to a country to adopt an industrial policy it considers appropriate to its environment.

Nevertheless, neoclassical economists encourage LDCs to stick to horizontal or functional industrial policies because they consider that selective industrial policies create uneven competition, generate rent-seeking behaviours and corruption, and limit state capacity. Furthermore, those championing industrial policy could be recruited and promoted on non-merit basis but on favouritism or in return for political support causing public resources wastage. However, under modern industrial policy public and private sectors collaborate to identify and address binding constraints using both horizontal and vertical industrial policies because no single industrial policy fits all LDCs' circumstances (Felipe, 2015). This is because public sector sometimes lack "technocratic knowledge" or expertise and skills to deal with industrial or sectoral problems (Salazar-Xirinachs et al., 2014). Abebe and Schaefer (2015) stress that government bodies dealing and implementing industrial policy should be well equipped with relevant technical knowledge. Otherwise, even with enough government support industrial policy may not result in effective structural transformation and meaningful industrialisation.

Contrariwise, heterodox economists encourage LDCs to apply selective industrial policy, and be very particular about its design and implementation. Due to pervasive failure of market system through sending out price signals, which can end up giving socially undesirable equilibrium and allocation of resources, governments of LDCs should adopt selective industrial policy. In addition, assumptions or characteristics of market system like perfect competition and perfect

⁹ Government of Brazil in 1969 founded Embraer a state-owned enterprise to develop its own aircraft. It assisted Embraer through public procurements, financing education, training of technicians and aeronautical engineers, R&D support, special tax regimes and subsidies. Over time, Embraer has competed with Bombardier, a Canadian aircraft manufacturer, and today Embraer is now the third largest aircraft manufacturer after Airbus and Boeing.

information and knowledge are highly unrealistic, thus relying on market system in the hope that horizontal industrial policy will work can be suicidal and misleading.

Leading the market is almost similar to the idea of creating winners while following the market is highly linked to picking winners (Wade, 2010). Regarding leading the market, government makes investments in sectors or industries where private sector would not want to invest and in so doing, it creates potential new opportunities and national champions. Government undertakes completely new activities or projects that it deems to spur structural transformation. As to following the market, government supports investments where private firms are already undertaking or would undertake notwithstanding state intervention. Here government intervenes to support established or existing industries, thus it reinforces existing structural heterogeneities. An example of following the market is the cut flower industry in Ethiopia where government supported an already fully private-driven industry without defining priority areas. Government was very supportive by making arable land affordable at low cost, negotiating reasonable freight charges with the country's airline and setting up an institute that responds to the flower industry's needs (Altenburg, 2011, p. 73).

Guan and Chen (2012) and Lobsiger and Zahner (2012) discuss extensively on whether industrial policies should comply or defy comparative advantage. Because many developing countries generally lack technical expertise and physical capital it is wiser for them to implement policies on industries or develop their industrial along areas they have relative comparative advantages (Lobsiger & Zahner, 2012). Nonetheless, comparative-advantage-defying proponents argue that for LDCs to fully industrialise they should defy the logic of complying or conforming to comparative advantage policies by creating completely new industries. Industries or sectors based on comparative-advantage-conforming policies leave developing countries trapped in underdevelopment with no or limited options to technological advancement and learning. Industrial policy is a process involving creating and developing new industries as well as improving existing ones through experiments and testing. In developing countries industrial policy should advance industrial development by targeting innovation and technological progress (Soete, 2007). Thus, developing countries should defy development that is solely grounded on comparative advantage. To transform economic fortunes, it is imperative that LDCs build new comparative advantages with strong emphasis on high-technology manufactured products.

However, developing economies with limited capital and technology should avoid rushing into implementing comparative-advantage-defying policies because some industries may be capital-intensive meaning high production costs, hence little gains. After accumulating enough physical and human capital, they can progressively defy comparative advantage policies and upgrade or migrate towards high productivity industries. During the gradual comparative-advantage-defying process, developing economies can use the infant industry argument so that the state can develop industries and enhance productive, technology and innovation capabilities (Haraguchi et al., 2017).

Effective adoption of comparative-advantage-defying policies requires government to play a facilitative role for enabling private firms to realise or exploit latent comparative advantages. After all, industrial policy is about helping an economy to get unstuck from comparative-advantage-conforming to build new comparative advantages and create completely new industries and sectors (Chang, 1994). Today's advanced and new industrialised economies adopted comparative-advantage-defying policies to propel structural transformation. They did not just wake up manufacturing sophisticated products but they started by building certain skills and capacity in particular industries, identifying and bridging certain gaps in value chains, etc. Nevertheless, comparative-advantage-conforming policies remain relevant as they provide a basis or useful guideline in determining the infant industries to selectively support and nurture (Haraguchi et al., 2017). Because of both government failure and market failure, scholars still disagree on which form an industrial policy should take and how should it be implemented (Rodrik, 2009b). For example, Lobsiger and Zahner (2012) argue that industrial policy should follow comparative advantage while Ha-Joon Chang totally rejects industrial policy based on comparative advantage because it cannot take developing countries anywhere. He further recommends LDCs to go beyond comparative advantage and embrace a more proactive industrial policy as experienced by the likes of Japan, South Korea and other East Asians.

2.3.2.1 Rationale for Industrial Policy

Governments have industrial policy for various reasons, so it is worth examining the key arguments. One such basic argument in favour of industrial policy is that free market economy may result in a socially inefficient and undesirable equilibrium due to market failures. These alone

provide sufficient justification for state intervention and adoption of industrial policy (Hausmann et al., 2008). Free market system fails to produce public goods due to free rider problem and non-profitability, and if they are produced, externalities to the society are not fully accounted for. In addition, the market mechanism does not correct signal prices to firms wanting to venture into new and viable activities because of simultaneous investments in complementary or interrelated activities. Government also intervenes to promote or support investors willing to make first move in new areas of investment which could not be possible without the guarantee or knowledge of complementary activities (Andreoni & Scazzieri, 2014; Toner, 1999) and appropriation of positive externalities (Altenburg, 2011). When competition is excessive in a market economy, monopolies arise and end up abusing their power against the reason they were formed. Grossman (1990) also emphasises that if economies of scale, externalities and capital market imperfections exist the market system fails to give desirable and efficient outcomes.

According to Ray (1998), with economies of scale firms can realise profits after producing a particular level of output and before that they still incur fixed costs despite not making any profit. He also argues that firms need time to perfect or improve their production techniques (learning-by-doing) until they become profitable, and some firms are limited by their size, thus government support is critical to reduce large fixed entry costs.

As for externalities, there are projects or certain activities that seem unprofitable for private firms who directly produce products yet positive the benefits from such actions spill over to other firms. Under such scenarios government is justified to step in through protecting or subsidising investments and take a leading role because of free-rider problem under production will occur if they are solely left in private sector's hands. Training of workers and research and development (R&D) are among activities that could generate positive externalities to third party.

As a financier, government provides alternative credit or funding for profitable investment opportunities that may face difficulties in finding financial support from private banks and other non-state-run financial institutions. These institutions may be unwilling to finance because of information asymmetries on the borrower's side. Unlike private firms, government has an obligation to spur industrial policy because it has the financial muscle through printing money to fund investment projects with high risk and high return. High-risk projects direct and indirect

funded by government are not unique to only developing countries. Even economically advanced countries also do that often. According to Haraguchi et al. (2017), Britain for example during the 18th century subsidised the textile industry, and likewise Germany, Sweden and USA during the 19th century funded the aircraft, chemical, pharmaceutical and many other strategic industries. It is clear that government drives industrialisation towards desirable levels and promising industries.

Despite market failures, government can also fail. Those who oppose government intervention claim that governments in developing countries fail because they lack resources to fund and implement industrial policy (Krueger, 1990) and because of information asymmetries, corruption and rent-seeking behaviours (Hausmann et al., 2008). Nevertheless, industrial policy con-arguments are not centred on industrial policy's economic advantages, but on conflicting views and impediments to industrial policy's relative importance and pervasive implementation (Hausmann et al., 2008). Also, critics of developmental state oversimplify industrial policy con-arguments (Moudud & Botchway, 2008).

Furthermore, arguments against state-led industrialisation based on rent-seeking and corruption do not stand as overwhelming obstacles (Wade, 2009). Empirical evidence shows that industrial policy averagely works, hence there is still enough theoretical justification for the state to use industrial policy (Rodrik, 2009b). Haraguchi et al. (2017, p. 46) stresses that successful industrial policy rests upon good implementation not strong theoretical justification. Industrial policy remains an important tool through which the state can change the production structures in an economy. Nevertheless, benefits from industrial policy may be not imminent but with time and through learning-by-doing they will definitely trickle.

It is no easy task to have a successful industrial policy, but since other countries like China, South Korea, Japan, Taiwan and other Asian countries did, it is enough justification for any government to adopt industrial policy. Also, Hausmann and Rodrik (2003) express that development is self-discovery, and unsurprisingly industrial policy can be unsuccessful in the initial stages. Incidentally, all today's advanced economies experienced that and they became successful by learning from their mistakes or unsuccessful stories. With any development strategy, there is little predictability and sometimes no guarantee of success, hence success involves

innovation and learning through experiments, trials and even errors Hobday (2003). That being said, government intervention using industrial policy are critical for industrialisation to take off.

2.3.2.1.1 Industrial Policy Design and Its Implementation Process

Despite ampler theoretical justification for adopting industrial policy than against, but there are very few success stories of industrial policy. Justification for industrial policy should be not be based on failure or success. Thus industrial policy success requires a good designing and implementation process. World Bank (1993) highlights that industrial policy can successfully work on the theoretical grounds but can fail to work in practice. State involvement is crucial for industrial policy because it fosters and supports accumulation of innovation, technology and production capabilities. Nevertheless, it is no guarantee for its ability or effectiveness to implement and deliver. Industrial policy designing and implementation are associated with risks and failures, thus it is no easy task to do. Present and past experiences demonstrate that successful industrial policy requires a sophisticated government with strong capabilities to design and implement industrial policy process. Moreover, arguments concerning industrial policy should centre less on activities the policy should encourage and best policy instruments, but should concentrate more on industrial policy process, organisation and objectives, and how local firms can maximise benefits from cooperating with foreign firms (Wade, 2009).

Since industrial policy designing and implementation is linked to stage of development and is both country- and time-specific (Peres & Primi, 2009). At initial phases of development, industrial policy should promote industrial development and at later stages, it should stimulate competition (Acemoglu et al., 2006; Khan & Blankenburg, 2009). Sala-i-Martin et al. (2008) highlight that development policies and strategies depend on which development stage a country falls, that is, factor-driven (stage one), efficiency-driven (stage two) and innovation-driven (stage three). Countries in stage one should build competitiveness founded on their resource endowments, with policies focusing on improving institutional capacity, infrastructure and stabilising macroeconomic environment. Those in stage two should concentrate on evolving better and efficient production processes and increasing product quality by emphasising on harnessing technology and higher education and training. Economies in stage three should use sophisticated production processes and their policies should focus on innovation and R&D. Thus,

industrialisation should be gradual and follow the development stages or processes. Economies at factor-driven stage should adopt a more interventionist industrial policy because between them and those at innovation-driven stage is high productivity gap, large variation in entrepreneurial competences and manifold market failures (Reinert, 2009). As economies graduate the development ladder government roles should be minimised and transferred to the market (Altenburg, 2011). Therefore, LDCs require a lot government support to develop the private sector while high-income economies require limited government support because they have a well-developed private sector. What is more, many middle-income countries particularly those in Asia and Latin America are now aware that the only way to come out of their vicious middle-income trap (MIT) is by implementing activist industrial policy and advancing technological upgrading (Felipe, 2015; Lavopa, 2015; Noman & Stiglitz, 2017).

Countries at different development stages due to differences in human resource, infrastructure and technological innovation needs face different development challenges, thus require different industrial development strategies (Hosono, 2015). Even selection of industrial policy, who does what and what tools to use all depend on the country's stage of development (Felipe, 2015). Also, industrial policy designing and implementation must adapt to a country's stage of economic and political development, endowment structure, government capabilities, country's policy space, industrial, institutional and technological environment because policies that are effective during a certain period for a particular industry may not work for other sectors (UNIDO, 2020b).

New and different challenges emerge as industries develop and mature, thus industrial policy strategies should shift and focus on long-term sustainability and viability of these industries. Moreover, government support should as well respond or linked to these changes (Abebe & Schaefer, 2015). After world war Europe's industrial policy focused on developing coal and steel industries, and from the 1970s onwards it focused on supporting innovation and high-technology industries (Soete, 2007). Also, South Korea successfully changed production and export patterns through her industrial policies which deliberately targeted high-technology industries (Yülek, 2018).

Industrial policy formulation and designing process follows different approaches (Fu et al., 2011; Hausmann et al., 2008; Hidalgo et al., 2007). The first approach is Hidalgo et al. (2007)'s Product Space Theory which links a country's exports with its know-how capabilities to produce. It is an extension of revealed comparative advantage, and it suggests that developing countries should develop products that are closely connected to the ones that they are already producing. Otherwise, if developing countries rush into developing products that are beyond their capabilities and far unrelated to what they are already producing, that is, defying comparative advantage, can lead them MIT or unsuccessful take-off. Developing countries should gradually upgrade production capabilities and subsequently introduce new products when they have capital and technology. There is a dilemma in following product space theory because a country can be stuck exporting raw materials, thus making it very difficult to move into sophisticated products. Going by this theory may mean industrialisation remains a pipedream because it locks a country in the lower end of global value chains (GVCs) only producing and exporting semi or unprocessed products or isolated products (Hidalgo et al., 2007). Otherwise, not embracing and prioritising technological-based industrialisation and structural transformation will make LDCs continue participating at the lower node of GVCs.

Hausmann et al. (2008) propose "Growth Diagnostic Framework" approach, which is a decision tree methodology that prioritises policies that stimulate economic growth. The approach identifies, figures out and removes most binding constraints to growth. Any country can apply the approach based on its prevailing domestic opportunities and constraints. However, it disregards the competitive and complementarity nature of different constraints, fails to capture and specify between general (macro) and specific (micro) constraints on the degree of their effect on competitiveness of certain sectors of the economy (Altenburg, 2011).

Another approach is "Growth Identification and Facilitation Framework" (Fu et al., 2011). It works on the assumption that government identifies industries or sectors where firms exhibit latent comparative advantages¹⁰. The approach follows a six-step framework or procedure

¹⁰ According to Fu et al. (2011) and Guan and Chen (2012), it is comparative advantages that a country generally possesses in specific industries or sectors or goods, but because of excessive transaction costs for instance transportation, bad infrastructure and institutional bottlenecks it is prevented from realising them.

that facilitates private firms by removing binding constraints or difficulties preventing them from venturing in latent industries. Government intervenes specifically to deal with information asymmetry, externalities and coordination failures that may constrain private firms.

Firstly, government chooses model economies that resemble its economic structure but with income per capita 100 per cent higher than its average. It also identifies successful tradable industries in these countries during the past 15-20 years. However, the problem is comparative advantage and demand of commodities in any country change over time, thus the 15-20-year rule may not work for some products. Secondly, government removes binding constraints for active local private firms to enable them to upgrade technology in identified industries in step one. Nevertheless, government may fail to identify these binding constraints or may identify but fail to correct them. Thirdly, government can attempt to attract foreign ones mainly from the model economies, or can organise incubation programmes to promote start-ups by new domestic firms if there are no active local private firms. In East Asian economies governments crafted policies that promote joint ventures in sectors or industries where local firms exhibited knowledge gaps.

Step four involves government watching closely private enterprises' spontaneous self-discoveries and provide meaningful support to the successful ones, particularly private innovations in new sectors or industries. Because many LDCs face problems of poor infrastructure and business working environments, in step five government develops industrial parks or special economic zones as a means to stimulate firm entry, foreign direct investment (FDI) inflow and industrial cluster formations. In step six, government considers compensating successful pioneer firms in the targeted industries. These steps may produce positive results provided government has capacity to execute duties as stated in the industrial policy, leadership has political will and there is clearly stated relationship between state and business to avoid state or business capture. A detailed explanation and methodological framework of the six steps is in Guan and Chen (2012) and Lobsiger and Zahner (2012).

Every country has at least an industrial policy; nevertheless, some countries' policies are failing to lead to effective and meaningful industrialisation and economic development. Having good industrial policy documents is one thing and to implement it properly is another thing. Without proper institutions and appropriate implementation plan that oversee the whole system is

like heading to war with guns without bullets. In that regard, successful industrialisation for economic development requires good industrial policy that is supported by strong and properly established institutions and investment climate. Also, industrial policy designing and implementation should be cognisant of realities in global politics, consumption, production, trade and natural endowments of each country (Tregenna, 2015). Furthermore, it is not just about having an industrial policy targeting manufacturing sector but the policy need to be supported or complemented by macroeconomic policies (exchange rate and interest rate), education and skills development policies, labour policy, technology policy and trade policy (ibid).

2.4 CONCEPT OF INSTITUTION

Government or market can intervene to guide industrial policy, yet some countries fall short of industrialisation. Effective industrial policy requires stable and predictable institutional environment. Development scholars also stress institutions are key for development and growth. Thus, there is a direct and indirect link between economic development, industrialisation and institutions. The central question is what institutions are and what constitutes institutions. Institutions can mean “rules of the game or an organisation,” (Van Arkadie, 1989, p. 153). According to North (1990, p. 3), “institutions are rules of the game in a society or, more formally, are the/ humanly devised constraints that shape human interaction.” Nevertheless, good institutions do not necessarily have to be western or American because good institutions in one country may turn to be bad in another (Chang, 2002). China’s institutions for example are defined as weak or bad in western view, yet despite that, the country has realised enormous industrialisation, economic development and poverty reduction. Therefore, developing countries should develop their institutions by learning from what advanced countries went through instead of having them imposed or just importing them from advanced countries because the imported institutions can be incompatible with their development conditions and needs (Chang, 2002, 2007a).

They can be established both formally, such as property rights, constitutions and laws, and informally such as codes of conduct, culture, customs, sanctions, taboos and traditions (North, 1990). Both collectively contribute to economic development (Amin, 1999). Informal ones are usually neglected in policy circles, yet they shape formal ones, and are critical for economic growth and development (Van Arkadie, 1989). Informal institutions like cultural norms or societal values

can influence people to obey or disobey some formal institutions (Szostak, 2009, p. 234). However, informal institutions have limited influence over contracts and property rights enforcements (Acemoglu et al., 2003). Rodríguez-Pose (2013, p. 1042) states, “the problems of measuring institutions, their space and time variability, the difficulties for defining the right mix of formal and informal institutions ... makes establishing overarching guidelines for institutional intervention nigh to impossible.”

According to Vitola and Senfelde (2015), formal and informal institutions guide, enable, constrain, influence and direct economic agents’ behaviour. The benefits and costs of obeying or disregarding institutions also shape agents’ behaviour. Formal institutions such as law, evolve with informal ones such as culture and norms, thus formal institutions are easily accepted if they do not conflict with the informal institutions; therefore, formal institutions usually underpin informal institutions, but informal institutions also complement and reinforce formal ones (Roland, 2016, p. 178). Nevertheless, institutions are country- and time-specific, and they develop with a country’s economic development. Firstly, institutions differ by geography and are not uniform across countries. Geography shapes both the country’s type and quality of institutions (Easterly & Levine, 2003). Secondly, institutions’ impact on economic development is a factor of time. That is, what may be good institutions at one point in time may become inappropriate over time (Storper, 2005, p. 44).

Formal institutions are easily measurable and have a standardised measurement while informal institutions do not. Formal institutions can take economic, legal and political form. Nonetheless, attributes of institutions are sometimes not fully captured by the indicators of institutional quality (Oman & Arndt, 2006). There are several indicators of institutions, and they include economic freedom index, doing business index, governance index, global competitiveness index, political risk rating, etc. Economic freedom index is calculated from 25 components comprising five areas namely; “size of government, freedom to trade internationally, legal system and property rights, sound money and regulation,” (Gwartney et al., 2019, p. 4). Governance index comprises six attributes namely; “control of corruption, government effectiveness, regulatory quality, rule of law, political stability and absence of violence or terrorism and voice and accountability,” (Kaufmann et al., 2011, p. 221). “International country risk guide rating or

political risk rating is calculated from 22 variables consisting of three risk subcategories namely; economic, financial and political,” (Political Risk Services Group, 2019, p. 1).

2.5 MARKETS AND STATE’S ROLE IN ECONOMIC DEVELOPMENT AND INDUSTRIALISATION

Nearly every country endeavour to attain high economic development and industrialisation, but not every country is able to do so. Nevertheless, literature disagrees on who is responsible for championing, reorganising and transforming economic activities and managing institutional, administrative, political and social factors remains highly controversial in economics. Some scholars argue that markets are central while others stress that it is the state’s role to facilitate social and economic development process. Throughout economic history, there have been controversial and endless debates regarding the markets or state’s role in industrialisation and economic development. These debates revolve around market and state’s salience and significance in promoting industrial development and economic development. Many policymakers and scholars recognise the criticality of market and state as agents of industrialisation and economic development, but have reservations on the relative importance of each (Hermes, 1997).

Literature shows that economic development and industrialisation are country-, context- and time-specific, thus, countries industrialise and experience structural transformation and development along different paths and times. These differences emanate from variations in economic sophistication, amount of natural resource endowments, geographical location, history, capabilities and type of development orientation on the country’s top political leadership (Altenburg, 2011, p. 34). Nevertheless, even countries with similar initial conditions still follow different development trajectories. The overarching pillar behind these differences rests on the effectiveness of markets and state to stimulate industrial policy for sustained industrialisation, structural transformation and development.

There is also growing interest in using industrial policy to overcome certain market failures that may hinder entrepreneurial innovation, which is essential for creating employment and promoting low-carbon industrialisation (Ács & Naudé, 2013). Nonetheless, scholars still differ on whether industrialisation should be market-led or state-led. Moreover, some governments and

policymakers lack practical information regarding market feasibility and ability of the state to promote industrialisation and structural transformation through industrial policy.

2.5.1 Market-Led Development and Industrialisation

Neoclassical literature argues that East Asian economies successfully industrialise through free market system and very limited state intervention. It further stresses limited state intervention was only through functional industrial policy, which primarily created a favourable business environment by investing heavily in infrastructure and human capital, and maintaining macroeconomic and political stability. State intervention in East Asian economies was not static. For example, they used import substitution industrialisation (ISI) in the early stages, but later upgraded to export-oriented industrialisation (EOI). ISI is a secondary inward looking policy, which seeks to preserve foreign currency and make the economy self-sufficient by relying on domestically produced goods instead of importing while EOI is a secondary outward looking policy that seeks to generate foreign currency by exporting domestically produced manufactured goods (Todaro & Smith, 2015, p. 632). ISI reduces dependency on foreign produced goods by producing locally manufactured commodities. It builds domestic industrial capacity by encouraging local firms to produce manufacturing goods instead of imported ones. EOI builds domestic industrial capacity by pushing domestic firms to produce manufactured products for export and foreign currency earning.

Accordingly, East Asian economies succeeded by getting prices right, that is, state intervention did not distort price mechanism. State intervention allowed markets to signal allocation of economic resources. Critics of state intervention argue that it causes inefficiency by distorting prices and misallocating resources, hence failing to promote structural transformation, economic growth and prosperity. Unsuccessful stories in Latin America are attributed to excessive government intervention and protection of domestic firms, which caused market inefficiency. ISI failed in socialist and many other LDCs because they just concentrated on building physical industrial infrastructure without creating competitive industrial environment, nursing entrepreneurial innovativeness and promoting technological advancements (Altenburg, 2011, p. 29). Furthermore, selective industrial policies in Latin America created a fertile ground for rent-seeking behaviours, which eventually resulted in inefficient resources allocation.

ISI's ineffectiveness in Latin America prompted growing pessimism about activist industrial policy, thus catalysed Washington Consensus and countermoves against developmental state. Washington Consensus' ten-point reforms are deep-rooted on classical economic ideology that advocates free market system as a panacea to economic development problems faced by LDCs.

Nevertheless, WTO allegedly limits LDCs to pursue selective industrial policies the same way their developed counterparts did, but rather encourages and obligates them to pursue functional industrial policies (Bora et al., 2000; Dicaprio & Gallagher, 2006; Wade, 2003). Moreover, effective from 2000, the WTO embarked on using certain agreements¹¹; although they do not ban, but they limit the options or space available for LDCs to effectively implement activist industrial policy (Natsuda & Thoburn, 2014; Shadlen, 2005). However, WTO agreements do not directly cover other policy measures¹² which governments of LDCs can make use of to alter structural change and promote industrialisation. Another challenge to LDCs is the unprecedented rise and growth of China which according to Kaplinsky and Morris (2008) has eroded or closed the available avenues for developing countries to catch up using technology and innovation upgrading.

Nevertheless, the last two to three decades saw insignificant developments and structural transformation in many LDCs. However, the great depression of 1930s and crisis of 1998 and 2008 were enough evidence that free market was a failure and capitalism was self-destruction and inflicting making state intervention a necessity (Carvalho, 2009). Under a laissez faire, there is no industrial policy since the price mechanism automatically reallocates resources to sectors where they are needed. The state's business is just to ensure economic and financial stability while markets determine the rest. However, free market has its own pitfalls, and fails to promote industrialisation and structural transformation.

¹¹ The agreements include, "General Agreement on Trade in Services (GATS), Agreements on Trade-Related Investment Measures (TRIMs), Subsidies and Countervailing Measures (SCMs) and Trade-Related Intellectual Rights," (Natsuda et al., 2020, p. 5).

¹² See Haraguchi et al. (2017, p. 116) for the list.

2.5.2 State-Led Development and Industrialisation

Given that today's industrialised countries adopted active industrial policies, and market system failed to promote industrialisation and economic development in many LDCs, it is clear that the states or governments of LDCs must play an active role in overcoming structural rigidities inherent in these countries. The private sector in LDCs generally engages in low-technology manufacturing, where the bulk of the goods are consumer goods destined for the domestic market. However, concentrating too much on these goods does not accelerate industrialisation and economic development. Because there are industries such as heavy electricals and chemicals, fertiliser, iron and steel and machine tools that require large investments and have long gestation periods, but private firms are always hesitant to make investments in these areas, thus, the state should therefore chip in to start investments and make establishments.

Although private firms can invest in such industries, they do not account for social costs, and concurrently social benefits are not distributed equitably in society. In such cases, government must use regulations and policies to control and achieve equitable and balanced growth. The state should promote investments in industries that target high-technology exports and are into import substitution. If private firms are hesitant to do so, the state should lead the process or initiate private sector involvement through providing cheap finance, tax incentives and world-class infrastructure. Through designing and implementing effective and judicious industrial policy, the state can encourage these developments and promote private sector participation. LDCs' underdevelopment problems are so massive that they cannot be left to the free market. Therefore, government intervention is indispensable for promoting industrialisation and economic development in LDCs.

State intervention in industrialisation and development is based on non-competitive or imperfect markets which results in externalities and diseconomies of scale, as well as market failure in providing public goods (Chang, 1994; Grossman, 1990). It is undeniable that markets alone are incapable of producing dynamic structural transformation that is necessary for meaningful economic development (Stiglitz, 2005). Today's advanced economies adopted activist industrial policy, yet their recommendations on LDCs is contrary to what they did (Chang, 2002). Neo-classical economists are too quick to forget that manufacturing success stories of today's developed countries and their industrial dominance at present were made possible through

productive government interventions, which laid much of the needed groundwork. Industrialisation not free trade is the secret to economic development, thus LDCs need freedom to design and implement their own development strategies in the same manner today's industrialised countries did (Skarstein, 2007).

Empirical, historical and theoretical point of view that market imperfections are deeply problematic (Moudud & Botchway, 2008). Free market system sometimes fails to yield a socially desirable outcome. It is primarily concerned about private benefits and costs and disregards social ones. Public goods are non-excludable, thus free-rider problem arises because the market cannot stop non-payers from consuming leading to underproduction of the good (Olson, 1965). Given the nature of public goods, the state has a genuine reason to intervene and produce them for society.

Economies of scale argument emphasises that government intervenes because in a free market certain projects are non-profitable to private firms owing to their size. Huge projects may require high level of technology, huge investments in capital and R&D up to a particular level of output before profits are realised. Sometimes firms require more time to learn how to produce efficiently. During the learning period, costs can be high, thus discouraging or making it difficult for new firms with high potential to enter. Under these situations, selective industrial policy becomes key in promoting industries that exhibit high potentials, enabling them to learn and connecting industries with stronger economic linkages and sustained industrialisation (Cimoli & Katz, 2003). Sectors like these require selective industrial policy, thus the state should not always limit itself to horizontal industrial policies (Hausmann & Rodrik, 2005, p. 79). Government intervention helps to reduce initial fixed costs and improve overall production efficiency.

Another justification for state intervention through industrial policy has to do with the problem of externalities. Externalities are benefits (positive externalities in this case) or costs (negative externalities) spill over to a third party due to actions done by another party. With positive externalities the state intervenes by subsidising (education, health, R&D) to promote actions (production or consumption) and as for negative externalities (pollution) it taxes or bans actions for the benefit of third parties (Chang, 1994, p. 11). According to Hausmann and Rodrik (2003, p. 629) laissez-faire fails to allocate more resources to activities or projects such as innovation and technology that generate positive externalities and if one firm undertakes the

project others will free ride. Consequently, government intervention is justified to discourage under provision of innovation and technology as well as encourage and protect innovation and entrepreneurship. However, according to Xu (2011, p. 1078) lessons drawn from a number of past and current studies reveal that without a well-functioning government economic development and markets do not grow spontaneously. Ghebresus and Luzze (2019) argues that neoclassical economic view was never brought about to solve economic development challenges faced by the developing world, but it rather evolved to deal with inefficient resource allocation in the developed world. In that regard, the development problems of developing countries require a developmental state that deals with instilling a big push and promoting innovation in the economy. The risks associated with government failure are argued to be better managed when the state builds and develops its industrial structure based on comparative advantage and simultaneously creating the conditions necessary to progressively move towards activities with high value (Altenburg, 2011; Lobsiger & Zahner, 2012). Besides arguments linked to market failure heterodox economists justify state-led industrialisation on strategic grounds. The main reason for industrial policy is the infant-industry protection argument where the state has to nurse promising enterprise until they become efficient and competitive enough to survive in international markets. On a general note, government can spur structural transformation and highly technologically intensive and demanding economic activities through comparative-advantage-defying or leading the market industrial policies. Beyond the reason of market failure, evidence in the last decade in Brazil, China, Europe and USA shows that government plays an active role in industrialisation and structural transformation by making courageous investments in internet and information and technology, innovation, green revolution and R&D (Mazzucato, 2013). However, according to Ács and Naudé (2013) successful industrial policy and industrialisation require a strong partnership between the state and entrepreneurs mostly in the private sector, while according to OECD (2013) three basic ingredients that include investment in skills, access to financing and adequate infrastructure are prerequisites.

In conventional economics, state-led industrialisation has always been linked with ISI failure in many LDCs where governments were discouraging imports in support of local producers. However, East Asian experiences reveal a different but fascinating story about the central role of the state in designing and implementing industrial policy for successful industrialisation and economic diversification. Their governments, through industrial policy, selectively applied

protectionism and offered preferential treatment to industries particularly those with potential to export (Dullien, 2016). They did not follow Washington Consensus, and they designed policies aimed at closing the technological gap between them and advanced economies (Stiglitz, 2005, p. 17). By not following Washington Consensus dictum and having a strong and functional developmental state¹³, the East Asians kept their heads above waters (Cimoli & Katz, 2003; Stiglitz, 2005; Stiglitz & Shahid, 2001).

Development economists and policymakers underscore industrial policy in economic development. According to Guadagno (2015, p. 75) Latin Americans (Brazil and Mexico) had higher per capita incomes than some East Asians (South Korea and Taiwan) during the 1950s, but thanks to industrial policy by the mid-1980s East Asians had surpassed Latin Americans by three times. This was not a miracle as World Bank (1993) stresses, but industrial policy played a crucial role in steering structural transformation East Asians. The East Asians used both carrots-and-stick measures, and simultaneously implemented EOI and ISI. According to Hausmann et al. (2008), they used a combination of carrots or incentives to reward complying firms and sticks to discipline and punish those that could not fulfil their mandate as agreed in the industrial policy. Nonetheless countries in Latin American imposed little discipline or sanctions to private firms and lacked performance criteria. Moreover, Latin Americans had limited export promotion and fewer incentives to promote science, technology and innovation, which ultimately slowed down industrialisation.

Before industrial revolution, government was always important in carrying out certain functions such as defence, building of public infrastructure (roads, railway lines and dams) and administration of justice, which individuals could not do themselves. Initially, states of developed countries were not active in industrialisation, but later took an active and regulatory function to protect consumers and maintain competition (Johnson, 1982, p. 19). Advanced economies continue to intervene and facilitate industrial upgrading through supporting R&D, patents, procurements, etc. Although they don't pronounce these actions as industrial policy (Fu et al.,

¹³ Amsden (1989); Erdođdu (2015); Evans (1989, 1995, 1997); Lall (1996); Onis (1991) and Wade (1990) explain at large the success of industrial policy in East Asians, which used a developmental state concept. Europe, Latin Americans and USA used the same concept to drive industrialisation and structural transformation. "A developmental state is a state that intervenes and guides the direction and pace of economic development," (Caldentey, 2008, p. 28).

2011; Lobsiger & Zahner, 2012), but they indirectly use industrial policy to select and support certain industrial or sectoral economic activities (Felipe, 2015). However, in LDCs the state has to take a developmental role rather than the market or private sector in setting up and developing the right industrial policy by getting involved in national and corporate issues and more capital-intensive investment projects (Amsden, 1989).

Virtually all states are key in allocating resources and controlling economic activities via administrative or legal means, providing infrastructure and creating favourable or unfavourable climate for businesses through exchange rate, price, fiscal and monetary policies. More recently, the state also protects environment and rectifies socioeconomic inequalities. Historical evidence reveals that the state ignited and facilitated successful take-off and catch-up in today's developed economies through a proactive role in structural change and industrialisation, which enabled firms to build resilient industrial bases over a long time (Cimoli & Katz, 2003; Fu et al., 2011). Mazzucato (2013) advocates for an entrepreneurial state, which ensures that government spearheads economic development and implements development strategies in practice.

Key to successful designing and implementation of industrial policy under a developmental state is a strong bond between economics and politics (Caldentey, 2008, p. 27). Furthermore, policies for specific sectors under a developmental state were not rigid, but they changed as concerned sectors grew. Further targeted interventions should be prudently designed and implemented. Instead of intervening to just support and create a protectionist environment that undermines and suffocates entrepreneurial creativity, dynamism, innovation and technological learning, state interventions should challenge and encourage entrepreneurs to be innovative. Nevertheless, no ideal industrial policy is universally applicable because countries differ relating to their cultural norms and economic history.

According to Wade (1990, pp. 25-26), there are five features that constitute a developmental state. Firstly, it has to design policies to achieve economic development by enhancing competitiveness, growth and productivity instead of just focusing on welfare issues. That is not to say welfare of its citizens is not important. Secondly, it should have necessary interventions and the commitment to implement what it says. Thirdly, the state should guide the market in economic development through well-crafted instruments and a less bureaucratic process.

Fourthly, the state should consult, engage and coordinate with private sector so that policies and instruments can be properly implemented. Fifthly, state bureaucrats should have the space to exercise their powers to rule in making decisions and implementing them without facing obstacles from politicians regardless that politicians reign. Mkandawire (2001, p. 290) also stresses, the state should not be a soft state, but it has to be a strong state with the capacity to determine and implement administrative, economic, institutional, political and technical factors in a sagacious and effective manner.

Theoretically, accountability, capacity, commitment, embeddedness and relative autonomy are also underpinnings of developmental state that contribute to industrial policy success (Evans, 1995, 2014; Lall, 2004). Those involved in industrial policy designing and implementation should also be clear about accountability, and the carrots-and-sticks associated with any policy (Hausmann et al., 2008). The principal-agent theory explains at length how the agent (private sector or state-owned-enterprises involved in industrial policy) is answerable to the principal (state) (Arrow, 1985). However, in reality application of the theory is not an easy task due to lack of information. Thus, achieving all these require a verifiable performance observation and a system with a series of rewards and penalties (carrots-and-sticks) based on the information (Collier, 2007). Government should be capable of defining strategic goals, designing conducive policies that are inclusive and sustainable, and implementing them effectively, establishing clear rules that act as guidelines for agents, effectively delivering complementary services and avoiding political capture by elites when creating and removing protection (Altenburg, 2011, p. 21). It also requires a close collaboration between government and business. For instance, South Korea government collaborated with the Chaebol¹⁴ to help them upgrade technologically, export and introduce new products, nonetheless government improvised discipline when a Chaebol crossed the line, and rights were immediately transferred to well deserving Chaebol (Amsden, 1989; Chang, 1994).

Furthermore, the state should resist capturing and corruption from private sector elites or bureaucrats should not abuse their access to power for personal benefits. The state should also find a delicate balance between full autonomy and full embeddedness because too much autonomy can reduce corruption, but fail to incentivise the private sector appropriately while too much

¹⁴ Chaebol is a Korean name referring to a family-owned business or industrial conglomerates.

embeddedness can expose the state to capture by business elites (Rodrik, 2004). Industrial policy success requires state and business elites to exercise their roles without overstepping each other (Evans, 1995). The state can also devise appropriate strategies and simultaneously avoid political capture from interest groups by having a thorough understanding of private sector needs, available opportunities awaiting them, and when to end support for certain firms or industries (ibid).

For effective industrial policy implementation, Wade (2010) stresses that a developmental state should entail four important conditions. Firstly, a relative degree of balance of developmental roles by the state and the business should be well maintained. Secondly, bureaucrats should be ready to serve and have a mind-set to deliver. Thirdly, a clear separation of political and economic bureaucracy should prevail. Finally, public officials responsible for industrial policy should have clearly defined roles. Furthermore, developmental state also possesses other additional features namely, “state legitimacy, society integration, economic development motivation and social-political stability,” Erdoğan (2015, p. 3).

Government can play crucial roles in industrialisation and economic development by facilitating, regulating, and participating directly through directly producing or consuming manufactured commodities (Chandra, 1992, p. 93). Government creates an enabling conducive climate for industrialisation through safeguarding investment, providing incentives, building infrastructure and protecting infant but promising industries. Promising infant industries require incubation, nursing and protection from government until they are able to face competition. Nevertheless, the protection should promote technological learning and discourage rent-seeking and corruption.

Government can be a financier and innovator (Peres & Primi, 2009). Through a national development bank, government can provide cheap resources or channel them to areas that generate highest returns or have high potential for positive externalities and strongest downward or forward linkages with other economic activities. State banks cover the that private banks cannot cover such as financing long-term projects or offering long-term loans at low interest rates to projects that nurture structural change (Guadagno, 2016). In both early and late industrialisers, there are state

banks¹⁵ dedicated for enabling structural transformation and industrial development, and they control and decide sectors or industries that deserve funding (Amsden, 2001; Chandrasekhar, 2016).

However, Wade (1990) suggests that government and markets can work together under a governed market approach. This entails a co-existence between state and markets, but the state spearheads the structural transformation process by encouraging, giving assurance and supporting private players or by regulating market operations. Wade (1990, p. 28) stresses governed market entails the state can either lead (“big leadership”) or follow (“big followership”) the market. Leading the market entails government to take initiatives that influence players on what, how they should produce and what technology to use. This involves designing policies that guide the market and providing public resources to lead the market. Following the market entails government taking up proposals from private firms and implement them. Big leadership implies government’s actions lead to greater impacts than would happen if the market leads. On the contrary, big followership implies market’s actions lead to higher benefits than would occur if government leads.

Despite strong theoretical justification for state intervention, outcomes of state intervention may even be worse than those of free market if industrial policy is inappropriately designed and implemented due to erroneous assumptions or state capture by interest groups (Altenburg, 2011). Just like a machine or car, which can kill people if not properly driven despite being helpful, the market system or state can lead to worst cases if not properly regulated. Therefore, a coordination or collaboration between government and private sector should build a resilient and discernible industrialisation strategy. A state with a developmental mind-set backed by a vibrant capitalist class (private sector) can design and implement effective industrial policy (Soludo et al., 2004). Lobsiger and Zahner (2012) emphasise government active role in coordinating structural transformation and industrialisation process is crucial. Coordination reduces both coordination failures and information asymmetries, but its effectiveness is determined by clearly specified roles of government and private sector. Nevertheless, government’s challenge is to balance between coordination of industrial policy and avoiding state

¹⁵ Countries with state banks include Brazil and South Korea (Amsden, 2001), Japan (Johnson, 1982) and China (Sanderson & Forsythe, 2013).

capture by the private sector. For LDCs to balance the two is a difficult task, but literature shows that East Asian countries managed in a successful way. Also, advanced economies like USA have limited the scope of state capture and rent-seeking by making constitutional provisions restricting interstate commerce and government intervention.

Industrial policy can sometimes fail to work as theoretically expected; nevertheless, historical evidence supports its use. Thus, having an industrial policy as a developmental tool is one thing, and failure to implement it is another thing (Noman & Stiglitz, 2017, p. 2). The failures can emanate from political frictions and institutional bottlenecks, and these are mostly not confined to industrial policy.

2.6 LITERATURE REVIEW

A country can achieve sustained economic growth and sustainable economic development through designing and implementing policies that target industrialisation mostly expanding economic activities within manufacturing sector. Industrialisation's economic development contributions are through promotion of employment creation, productive capacity and innovation. Institutional quality enhances economic development, innovation, industrialisation, investment and trade. Improvements in investment climate facilitate access to FDI which also facilitates transfer of technology and accumulation of capital thus drives economic growth and dramatically reduces poverty. This section presents a review of literature linking industrialisation and economic development, institutional quality and economic development, and then investment climate and economic development.

2.6.1 Economic Development and Industrialisation

Proponents of neoclassical economics state that development occurs when countries specialise in commodities or sectors where they have higher comparative advantages and lower production marginal costs and opportunity costs than others do. However, their opponents argue that not just any sector, but strategic sectors, particularly manufacturing sector explain much of the variations in development, growth, productivity and technological progress among countries. Evidence, both historically and theoretically, shows that attaining higher economic development and reducing poverty and inequality often follow a vibrant manufacturing. Commodity

dependence, especially agriculture, is usually associated with high poverty levels or correspondingly low HDI, because market concentration, price volatility and secular decline of long-term prices which characterise commodity markets, thus requiring government intervention through supply management, industrial policy promotion and regulation, and strong stakeholders' participation (Asfaha, 2008). Consequently, countries should embark on industrialisation and structural transformation towards manufacturing and modern services because primary activities have low incomes or wages, little value addition and do not create quality jobs. Furthermore, developing countries can overcome these difficulties and develop by devising different strategies including state interventions and judicious industrial policy tools (Akyüz, 2012).

It is well established that industrialisation plays an indispensable role on economic development and structural transformation processes. History informs that economic development goes hand in hand with economic and structural transformation. Industrialisation comes with long lasting economic and development benefits, some of them are deep-rooted in Kaldor's Growth Laws. It is undeniable that most successful economic development stories are linked with industrialisation and structural transformation (Chenery et al., 1986; Kuznets, 1966; Naudé et al., 2015; Syrquin, 1988).

Both industrialisation and structural transformation are the mainstay of economic development. They also stimulate higher productivity, which enhances economic competitiveness and growth. Moreover, industrialisation enables nations to diversify economic activities from extractive sectors, limited range of exports and low value exports to secondary sector and high-technology manufactured exports.

Economies that usually undergo faster industrialisation and structural transformation are also likely to experience faster economic development and have increased abilities to expand exports revenue. Africa has been failing to realise meaningful inclusive economic development due to growth that is not backed by structural change, industrialisation and manufacturing sector, but heavily linked to and driven by extractive sectors and less sophisticated products (Yameogo et al., 2014). Due to industrialisation differences, between 1988 and 2017, developed economies commanded a lion's share of manufactured products in world export markets followed by emerging economies whose share significantly increased over the period while that of LDCs

increased by just a miniscule percentage (UNIDO, 2019, p. 88). Authoritative empirical and theoretical literature reveals the cardinal role of industrialisation and structural change on economic development.

Huge leaps in economic development and prosperity that occurred in all developed countries including the industrial revolution which started in the United Kingdom, followed by other European countries and North America, and then Asian countries' transition from low income status to middle income status had one thing in common: industrial policy drove industrialisation of the manufacturing sector (UNIDO, 2020b). It will be a great mistake to expect Africa to realise high economic development without industrialising the manufacturing sector. Even other sectors (industries without smokestacks) such as tourism, horticulture and trade logistics (Newman et al., 2016) do not have the same impact as the manufacturing sector in terms of benefits to the economy through job creation and revenue generation, because even their sustainability still depends on a vibrant manufacturing.

As a solution, developing countries should embark on export diversification as a way to hedge themselves against adverse terms of trade shocks induced by unstable export earnings. However, the diversification should not only focus on agricultural products (doing this is just a stopgap measure), but should mean producing a variety of industrial products that create positive externalities to other sectors and it is mainly through industrial policy can export diversification be viable (Al-Marhubi, 2000; Herzer & Nowak-Lehmann, 2006; Hesse, 2009; Love, 1986).

To start with, African countries should shift their mind-sets and treat primary sector or every economic activity with a business or entrepreneurship mentality and the intention to revive rural community and creating wealth not just take an economic activity as a way of surviving. As an example, even with good climate and soils for agriculture, Africa still spends billions and billions of dollars yearly to import food and other commodities it can produce locally. Africa should learn to add and create value to every commodity not just to export raw or semi-processed products. Prices of primary commodities e.g., cocoa beans frequently fall while prices of processed or manufactured products e.g., chocolate rarely or fall. Therefore, value addition can be an option for Africa to ring-fence her economy against price instability.

While value addition is good, it remains inadequate and not the best idea. It is just a temporary measure in which African countries should not take comfort because concentrating on value addition of primary commodities is not even enough to catch up and develop. Trying to catch up by increasing value added through improvements in primary products is a donkey work which yields less rewards (Yülek, 2018), thus developing countries need to shift gears and start to produce high-technology manufactured products. Changing the driver without changing the engine cannot make the car go fast, thus Africa can catch up not by just changing how to produce but also what to produce. Development is like a race or a game, if one does not change the pace or the tactics it becomes increasingly difficult to compete and win. Africa is still trapped in export of unsophisticated products with limited product space that do not support industrialisation and structural transformation. African governments should implement good policies and invest in public goods to attract investments in new technologies and sophisticated economic activities (Abdon & Felipe, 2011). Lack of support in technological innovations makes agriculture-led industrialisation unsustainable for Africa's growth, thus it is of limited relevance to Africa's current development scenarios (Senturk, 2011).

Specialising in low-technology and low-skilled intensive manufactured export products makes an economy prone to deteriorating terms of trade, while upgrading production towards high-technology and high skilled intensive products bring stability. Without export sophistication and structural transformation economies get caught up in MIT (Felipe et al., 2012). Through continuous technology upgrading towards high-technology manufactured products developing countries can circumvent MIT (Lee, 2013, 2019). However, earlier findings by Love (1983) and Tegene (1990) reveal that export diversification is not always accompanied by greater export earnings stability.

Chenery (1979) and Syrquin (1988) stress that diversifying from primary sector towards manufacturing sector makes economic growth more sustainable and sustained. This is consistent with industrialisation and Prebisch-Singer hypothesis, which prescribes developing countries to prioritise export diversification to guard themselves against deteriorating terms of trade, low value added, and slow productivity growth.

Specialising in manufactured products does not only combat exports earnings instability, but increases price and income elasticity advantages. Engel's Law states low-income levels are associated with higher fractions of income spend on agricultural products while high-income levels are associated with more expenditure on manufactured products. It therefore means, high income and more industrialisation result in increased expenditure on domestically manufactured products, thus less need to import manufactured goods thereby mitigating balance of payment problems and saving foreign currency (Chenery et al., 1986).

Failure to advance technologically results in industrial underdevelopment and lack of structural transformation (Gries et al., 2015). Many LDCs experience high economic growth rates. However, these growth rates are not sustainable. This is because economic growth unaccompanied by industrialisation and innovation and technological progress is donkeywork and unsustainable while one which encompassed by innovation and technological advancement is smart work and sustainable. Thus, technological advancement is central to structural change and industrialisation.

Nevertheless, there are some LDCs in recent years that have shown growing interest on industrial policy (revived old economic thinking). They shape their development trajectories by proactively applying industrial policy and use appropriate intervention levers with correct sequencing of policies and strategies. These are encouraging news for other LDCs striving to industrialise. However, it is difficult for latecomers to build capabilities and imitate if they try to venture into sectors or industries that are highly protected with intellectual property rights and where they are very slow or face difficulties in learning due to high barriers to entry or long-cycle times (Lee, 2019, p. 41). Thus, they should build technological capabilities along sectors or activities with high chances of entry and survival.

Industrialisation remains critical to development and is increasingly becoming evident that it is the only avenue for LDCs to catch up with advanced economies. Nevertheless, due to premature deindustrialisation (pre-industrialisation deindustrialisation) in many LDCs it is becoming more difficult for industrialisation to stimulate structural change (Tregenna, 2015). Moreover, China's dominance on global markets, limited access to innovation and technology, and deepening GVCs are among the notable current reasons making it difficult for many LDCs to

venture into high-technology exports, thus derailing industrialisation process (Ács & Naudé, 2013).

Econometric evidence suggests high economic growth and development are positively correlated with manufacturing sector growth rate (Egüez, 2014; Fagerberg & Verspagen, 1999; Ghebresus & Luzze, 2019; Guadagno, 2015; Lavopa, 2015; Olamide & Oni, 2016; Szirmai, 2012; Tregenna, 2015). Several other studies also confirm Kaldor's Law relating manufacturing sector and economic growth (Alexiou & Tsaliki, 2010; Güçlü, 2013; Hansen & Zhang, 1996; Marconi et al., 2016; Wells & Thirlwall, 2003).

There is huge body of empirical justification regarding industrialisation or manufacturing sector-economic growth nexus for single country and cross-country. Hansen and Zhang (1996) examine data from 1985 to 1991 on 28 regions in China and their results confirm that industrial growth is strongly related to growth of national income. Guadagno (2015) reviews some selected countries and finds that manufacturing sector causes economic growth. Analysing economic growth in 63 economies from 1990 to 2011, Marconi et al. (2016) also demonstrates that this growth was linked to manufacturing sector.

Nevertheless, there is limited literature both empirical and theoretical, linking economic growth or development and manufacturing sector or industrialisation with special focus on countries in Africa. An analysis of 45 countries in African from 1980 to 1996 reveals that compared to agricultural sector growth, manufacturing or industrial sector growth leads to high GDP growth (Wells & Thirlwall, 2003). Examining SSA economies Wonyra (2018) also finds that manufacturing sector stimulates growth for data on SSA countries from 1990 to 2015. However, improved human capital accelerates industrialisation and structural change's economic growth impact. In 37 African countries, industrialisation proven to be key to economic growth (Opoku & Yan, 2019). Single country analyses also reveal that industrialisation leads to economic development. For example, Diao et al. (2019) find manufacturing sector's labour intensity in Mauritius stimulates growth. Also in Senegal between 1960 and 2017, high economic growth was linked industrial output (Ndiaya & Lv, 2018).

LDCs can only close the development gap by engaging in industrialisation and producing high technology manufactured commodities. According to Lobsiger and Zahner (2012), in 1950

Japan was a developing economy and her income per capita was 20 per cent of USA, but by 1970 it was 63%. Japan closed this gap by transforming from agriculture to industrial sector and continuously upgrading certain key industries or sectors in manufacturing. The East Asian economies, Brazil, China, India and other latecomer industrialisers are also closing the development gap. All these give hope to LDCs and act as testimony that industrialisation, structural change and good industrial policy are the means to catching up.

2.6.2 Economic Development and Institutional Quality

Some countries have good industrial policy strategies yet they remain underdeveloped. What could be the reason to this underdevelopment despite frantic efforts to industrialise? Besides lack of industrialisation, another reason why countries follow different development paths is their differences in institutional quality. Economists generally view institutional quality as a very fundamental factor determining long-run sustainable and sustained economic growth. Evidence shows that malfunctioning government systems and poor institutional quality derail economic growth. The roots of literature on institutional quality's key role on economic development and growth is traced from Smith (1776).

Empirical literature recognises that economic performance is also determined by better institutions (Acemoglu et al., 2001; Acemoglu & Robinson, 2012; Chang & Andreoni, 2019; Easterly & Levine, 2003; Hall & Jones, 1999; Keefer & Knack, 1997; Knack & Keefer, 1995; Rodrik, 2004). The growth significance of better institutions however outperforms other factors (Klomp & De Haan, 2009). Rodrik (2004) emphasises that institutions' economic growth significance "trumps everything else". Nevertheless, Sachs (2003) posits geography as the main determinant. Although culture, geography and incorrect policy prescription are key to economic development (Acemoglu & Robinson, 2012), nevertheless, they do not match institutions, particularly economic and political. Despite United Arab Emirates (UAE) and Botswana being a landlocked and desert country respectively, they are a proof that strong institutions have far-reaching benefits than geography. Resourceful nations with diamonds and oil, etc. have turned out to be resource curses for (Sachs & Warner, 1995), however, with better institutions the two economies overcame the impediment of bad geography (Todaro & Smith, 2015). Precisely, Botswana owes her successful economic development story of from better and favourable

institutions, respect for property rights and good policies undertaken by government (Acemoglu et al., 2003).

Empirical studies relating better institutions and economic performance reveal that this relationship depends on country-sample size, country-income groupings and regions. For a study of 115 economies, Scully (1988) finds that better institutional framework, that is, political, civil and economic liberties, is cardinal to economic growth. Grier and Tullock (1989) find political repression to impact economic growth negatively in 43 and 24 African and American countries respectively. Also, differences in institutions cause capital accumulation and productivity per worker differences between countries (Hall & Jones, 1999). However, not only do better institutions, that is, property rights play a crucial part to economic performance but to investment (Knack & Keefer, 1995). Mauro (1995) finds institutions (corruption) not only slowing down economic growth but investment too. According to Fafchamps (1996) and Fafchamps and Minten (2001) absence of formal institutions raises transformation and transaction costs of exchange, thus affecting economic development. Transaction cost that are regarded simple in developed countries may not be so in developing countries. Poor institutions are generally associated with high transaction costs, thus constraining economic development process. The poverty penalty in LDCs is higher than that in developed countries because institutions in LDCs favour the rich, political elites and few connected while excluding the poor.

Rodrik (2000) also stresses that beyond enhancing economic growth, good institutions have an indirect positive effect on FDI (Asiedu, 2006; Lay & Tafese, 2020), human and physical capital, technological progress, trade (Baliamoune-Lutz & Ndikumana, 2007; Dollar & Kraay, 2003). According to Acemoglu et al. (2001, p. 1369) better institutional quality, consistent and less distortionary policies and secured property rights are not only good for growth, but also promote investments in physical and human capital. Better institutional quality has also ripple effects on economic organisations, investment and technological innovation, which are all determinants to economic growth and ultimately economic development (Rodrik, 2004; Wiggins & Davis, 2006). Furthermore, achieving long-run sustainable and sustained economic growth is possible when there is good education system and better institutions to promote R&D in manufacturing and protect the sweat of innovators (Aghion & Howitt, 2005).

Van Arkadie (1989) emphasises that government through policy interventions is very influential in modelling and moulding the qualities of formal and informal institutions of which government's institutions and interventions can be either helpful or harmful to economic growth. Governments of LDCs have a role to play in shaping the institutional framework and determining economic incentives. The centrality of government policy in shaping institutions is evidenced in East Asian economies where governments' leadership and policy direction managed to exploit opportunities presented by backwardness and have converged with advanced economies. However, Rodrik (2004) argues that more benefits to the economy are derived when the government puts more emphasis on getting the institutional environment right whilst maintaining enough balance and stability between autonomy and embeddedness than focusing more precisely on policy instruments applied.

An economy's long-run growth is fundamentally linked to institutions (Tebaldi & Elmslie, 2008). What is more, better institutions determine technology absorption, innovation and utilisation of newly invented inputs thereby stimulating growth. Better institutions foster both human capital accumulation and long-run economic performance (Dias & Tebaldi, 2012). Examining data for 100 countries, Lobsiger and Zahner (2012) find property rights and economic development positively related.

Moreover, Acemoglu et al. (2005) highlight the role of better institutions in influencing investment and reorganising certain systems of production which are all very fundamental to economic development. However, examining Asian and African economies Tran et al. (2021) and Yeboua (2020) underscore that an institutional threshold is imperative for effective economic growth. Having better institutions does not only do good to economic growth, but also provides a breeding ground for peace, security, rights as well as mitigate risks that can retard economic progress. According to Todaro and Smith (2015, p. 763), *"A good institution in this context facilitates conflict resolution, avoiding violence and doing so in a way that allows capabilities to grow. Without improvements in underlying institutions, purely political agreements come with the danger of relapse or can fail to create conditions for balanced economic development."*

Regressing a large cross-section of economies, Dollar and Kraay (2003) find a positive relationship between high growth rate in the long-run and good institutions. Nawaz et al. (2014)

and Valeriani and Peluso (2011) analyse a panel dataset comprising 32 Asian and 181 economies respectively. Their findings reveal the economic growth relevance of better institutions. However, the size of impact varies with the economy's level and stage of development.

Liu and Zhou (2015) find that on average institutional quality having a significant positive contribution to economic development. However, they find the influence to be more predominant in LDCs than the developed ones. Góes (2016) and Hayat (2019) also find a very significant and positive relationship between institutions and growth. Siyakiya (2017, 2018) also find that better institutions to be very significant as well as growth enhancing. Furthermore, Siyakiya (2018) finds institutions stimulating entrepreneurship.

According to Olong et al. (2019) institutional quality measured by economic freedom from 2001-2018 for 11 African countries, has a direct and meaningful relationship with the economic welfare or human development. Rizvi (2019) also analyses 20 developing East and South Asian and Pacific countries from 1995 to 2017 and finds that better institutions stimulate investment in health and ultimately economic growth.

Nkurunziza and Bates (2003) find better institutions (political stability) influencing positively on growth in Africa. Hashim Osman et al. (2011) find that 27 African countries' economic development process between 1984 and 2003 was mostly explained by institutional variable not through the conventional growth theory. Furthermore, an empirical investigation of 48 African economies reveals institutions important to growth (Epaphra & Kombe, 2017).

While many researchers acknowledge the overwhelming economic importance of better institutions, nonetheless, there are also inconclusive results continuing to emerge. Other studies find institutions failing to explain much of economies' development and growth. Institutions do not contribute to growth in 47 countries between 1950 and 1977 (Kormendi & Meguire, 1985), and for economic growth of 116 economies between 1965 and 1985 (Barro & Lee, 1993).

Nevertheless, better institutions such as having disclosure rules, binding and legally enforcing contracts and standards, and penalties for breaching or violating contractual agreements or obligations can solve problems like information asymmetric, hold-up and lack of coordination and commitment to a transaction (Roland, 2016). Informational asymmetry happens when a party

to the transaction lacks knowledge or information about the commodity under transaction. hold-up problem arises when a party to a transaction agrees to certain terms, but later starts to renegotiate new terms taking advantage of the weak bargaining power of the other party (Roland, 2016, p. 185). This is more prevalent in LDCs than developed. It retards economic development through causing underinvestment and damaging business prospects.

Lastly, strong institutions safeguard the integrity of government and the public service. The performance of government or a country depends on the competence and integrity of individuals occupying key government positions such as in the judiciary, state-owned enterprises, state commissions, etc. If people occupying these posts are corrupt, it means the end of government effectiveness because these people subvert the system and make it difficult to root out the corruption cancer, which then becomes entrenched throughout the system. Corrupt persons heading key positions in government make the system permanently broke and ineffective. For example, if police are in cahoots with criminals or crooks nobody will trust the police.

2.6.3 Economic Development and Investment Climate

Undoubtedly, growth and development also depend on investment. Literature states that rate of investment enhances economic growth. Besides stimulating economic growth, improving investment climate reduces poverty (Smith & Hallward-Driemeier, 2005; World Bank, 2004). For instance, significant reductions in poverty observed between 1980 and 2000 in China and India are by and large attributed to pragmatic improvements in investment climate (Smith & Hallward-Driemeier, 2005). Many governments seek to stimulate competitiveness, growth and other macroeconomic objectives by working to improve factors that affect policies investment climate. Among the factors hampering investment climate are corruption, red tapes, excessive regulations, rule of law and taxes. If not addressed, these can even cause firms to circumvent formal procedures of doing business resulting in informality. However, the sequence in which of the factors matter most or which factor should be prioritised in addressing investment climate is not clear (Manuel, 2015).

Abundant literature recognises the criticality of good investment climate to economic development and growth. Good investment climate reduces costs and risks to investment and acts as a conduit to the smooth operation of business and markets. Most of the factors exerting a huge impact in

affecting investment climate are within the purview of the state, which can work on them to create, manage and regulate the climate for appropriate and friendly business and market operations. Apart from promoting economic growth, Dollar et al. (2005) and Cárdenas-García and Pulido-Fernández (2014) also point out that having the right investment climate leads to improved socio-economic conditions. Nevertheless, to tackle the factors hindering investment climate head-on requires strong complementarity from highly educated human capital, well-developed physical infrastructure and technology and innovation. The general definition of investment is the use of economic resources to produce goods and services. It involves human capital, physical and capital investments. It can be from direct or foreign direct investment. However, for significant investments and capital accumulation to take place and for growth to occur, a conducive investment climate should prevail. According to World Bank (2004, p. 2), “investment climate is the set of location-specific factors shaping the opportunities and incentives for firms to invest productively, create jobs, and expand.” Dollar et al. (2005) state that, “investment climate is the ‘institutional, policy, and regulatory environment in which firms operate – factors that influence the link from sowing to reaping.’”

According to Pernia and Salas (2006) better investment climate enhances firm growth and productivity, thus contributing to overall economic growth in the long-run. Africa’s weak investment climate leads to low business, thus negatively impacting socio-economic development and economic growth (Ikejiaku & Mordi, 2010). Better investment climate or profile contributes to firm productivity by creating a breeding ground for firms to do investment (Bastos & Nasir, 2004; Dollar et al., 2005; Dollar et al., 2002; Escribano et al., 2008; Hallward-Driemeier et al., 2003; Khemani & Carrasco-Martin, 2008; Kinda et al., 2015; Subramanian et al., 2005) and attracts more FDI (Bayraktar, 2013; Quazi & Tandon, 2011). Improving investment climate enhances investment attractiveness, thus, better investment climate facilitates inflow of FDI, which helps domestic firms to do technology upgrading and be part of global value chains. It also boosts investment’s impact on economic development and growth. Furthermore, improving the investment climate does not only contribute to firm productivity, but also helps firms in deciding where to export (Aboushady & Zaki, 2016). Nevertheless, to make meaningful contribution to economic development, FDI should not come in dribs and drabs.

Given the above, it is pertinent for any pro-development government to formulate policies and regulations that stimulate business activities. The policies and regulations should be efficient,

predictable and transparent so that firms can unlock their investment potentials and incentivise them to partake investment. Furthermore, the strategies should seek to address all the impediments that affect the whole investment life cycle, that is, attraction stage, retention stage and expansion stage. However, the success of these strategies requires a coordinated approach among all the government agencies, departments and ministries involved in designing investment climate policies and monitoring and implementing investment reforms.

Industrialisation requires both stable institutions and better investment climate to thrive. Development of institutions needs time, which gradually strengthens industrialisation to take place. Moreover, better and stable investment climate stimulates entrepreneurship to take place, thus with entrepreneurial activities shifting productive resources from the agricultural sector to the modern sectors thereby stimulating economic development. According to Ács and Naudé (2013, p. 378) economic development requires good institutions in the form of good government and governance and industrial policy. These should emphasise on improving the institutional environment. Without a stable investment climate and well-developed institutional framework, industrial policy cannot be a good agent of industrialisation and economic development.

Most empirical evidence clearly suggests that industrialisation, institutions and investment climate are pertinent to economic growth. However, policymakers' task is to transform this growth into inclusive economic development and make the economy take advantage of evolving global competition. These researches have not included interact institutions and industrialisation, and investment climate and industrialisation to evaluate their impact on economic development. The dynamic relationship of these variables needs more evaluation within the general framework of growth theory. The analysis does not try to oversimplify the relationship and impact on economic development. Consequently, this thesis aims to add to debate and literature by empirically investigating how institutions and investment climate can enhance industrialisation's impact on economic development in African and Asian countries.

CHAPTER 3

COMPARATIVE INDUSTRIAL POLICY EXPERIENCES IN ASIA AND AFRICA

3.1 INTRODUCTION

Economic development, industrialisation and industrial policy landscapes have never been more different and widening than they are today. Developed countries are getting richer and more industrialised while many LDCs are getting poorer, prematurely deindustrialising and economically side-lined. Against a background of competing economic views about development and industrial policy, progress in few African countries and some Asian economies are proving doubters wrong regarding successes of developmental state and selective industrial policy.

Given that the industrial policy designing and implementation process is highly context-specific, economy-specific and time-specific, it is imperative to assess, compare and learn some lessons from the experiences of selected African and Asian economies. The two continents possess different levels of institutional efficiency and competitiveness, and face different challenges. Countries differ on economic structure, government effectiveness and institutional development, thus policymakers should not generalise policy conditions and blueprints, but should align industrial policy and development strategy with country's opportunities and binding constraints (Altenburg, 2011). Even countries with similar characteristics can still learn from each other as long as they have different developmental goals (Chang et al., 2016).

Development economists and industrial policymakers in LDCs can also utilise and draw lessons from different countries' experiences. This thesis uses successful stories of industrial policies adopted by Asian economies as learning lessons for African countries. Although it is a common practice to learn from success stories, it is possible to learn from failures too. However, comparing is not just limited to copying, but is also useful to create and learn new knowledge and ways of doing things and to develop capacity. In general, most Asian economies have demonstrated to be more capable of designing and implementing industrial policies than Africans and Latin Americans. Also, compared to their African and Latin American economies, Asians were generally good at policy mix, devoting financial resources to the implementation of industrial policy, capacitating and working alongside with private sector prioritising and focusing on

innovation and technological upgrading as key drivers of industrial development (OECD, 2013, p. 106).

For some economies, the designing and implementation of industrial policies had been very successful, yet this was not the case for others. Even in those economies where the designing and implementation had been successful, the learning process encompassed several trials, failures and errors until they reached stardom. Sustainable and stable economic development is likened to a bicycle which can maintain its balance the faster it moves (Reich, 1982, p. 852). This implies that the faster the economy increases its technological capabilities the more it can sustain economic development. However, this is possible when a country formulates and implements good industrial policy and has strong institutions. It is well-established that industrial policy leads to sustainable economic development, however, the designing and implementation is not straightforward because of a general lack of understanding of its selection, feasibility and orientation (UNIDO, 2020b).

We use case studies to compare and explore success and failure stories of industrial policy in selected African and Asian economies. Case studies derive evidence from six sources namely; archival records, direct and participation observation, documents, physical artifacts and interviews. However, this chapter uses qualitative information collected from several published country case studies by experts, grey literature (government documents, working papers, reports, white papers) and other visible evidences (Yin, 2014, p. 168). Nevertheless, some selected countries underwent several changes such as economic, social and political changes induced by COVID-19, which were not captured at the time of writing.

Instead of just analysing what and how the selected economies implemented industrial policy and achieved high economic development and industrialisation, this chapter however aims to learn and understand how and why these economies got it right. The section tries to disentangle questions such as, what strategies did these economies use, which constitute to the relative effectiveness of their industrial policies and what makes their industrial policies different from those of others. Furthermore, it seeks to understand what industrial policy and government intervention mean and how in each case study state intervention and industrial policy made a difference if there was any. We actually hope that the case studies can provide useful lessons to other LDCs, particularly Africans. Obviously, this thesis is not claiming to provide LDCs with all

the answers to their development and industrialisation challenges and needs. But, virtually all development challenges and industrialisation problems such as lack of energy and infrastructure, environmental degradation and pollution, diseases, poverty, and lack of innovation and technology, and etc. that both developing and advanced countries are facing in whole and in part respectively require activist developmental state and activist industrial policy.

The selected economies for case studies are among economies that did or are doing well in implementing industrial policy, while the industries are among the most developed and contributors to export earnings and GDP of each economy. Also, selection is according to a country's industrial policy designing and implementation in each industry. The first section presents how selected Asian economies designed and implemented industrial policy in various industries and the second section examines the same for African countries. Specifically, the highlights include achievements of each selected country, which challenges each faced and how it overcame them and what roles and variety of approaches each respective government pursued in industrial development of certain sectors or industries.

3.2 INDUSTRIAL POLICY IN SELECTED ASIAN ECONOMIES

Industrialisation and industrial policy have been subject of debate and study since more than the three past decades. The debate arose from transformative nature of newly industrialising economies (NICs) in Asia as exhibited by their adoption of industrial policies with varying characteristics. These countries had strong developmental state, which was capable of doing the right things at the right time and with strong political leadership that was capable of bringing citizens and businesses together for a national cause and political will to take strong decisions on development matters (Oqubay, 2015). The selected Asian economies comprise China, Japan, Malaysia, South Korea, Taiwan, Thailand, UAE and Vietnam.

3.2.1 China

China's GDP growth rate since 1978 averaged around 9.5% had been faster and more sustainable than any other country's in history. From 1977 to 2019, the country had never recorded

a negative economic growth rate, and over that period, the lowest it recorded was 3.92% in 1990¹⁶. The fast growth rate, development experience and pace of state involvement in economic activities were more than in other Asian economies. A combination of factors contributes to China's rise and global economic dominance. Very few countries match the market size, labour cost and supply advantages coupled with technological competence that China enjoys. Consequently, China's exports dominate traditional export markets and domestic markets where other LDCs used to occupy. China designed and implemented policies that were instrumental to development and strengthen competitiveness of local industries.

Many Chinese companies benefited from government policies, which encouraged collaborations between public and private sector, joint ventures and agreements in technology transfer and learning from other countries' experiences and strategic management of FDI (Yueh & Van Reenen, 2012). China's fast catch-up was due to joint ventures and agreements on technology transfer. This boosted China's productivity in producing manufactured products. By promoting backward and forward linkages and technological spillovers from FDI, China has managed to build up enough human and financial capital, and address infrastructural deficit. Søreide (2001) stresses technology transfers and industrial restructuring provide a launch pad to economic development. Through industrial policy, Chinese government helped firms in certain sectors to address innovation gaps and mobilise untapped capital and labour resources. Consequently, China ranks the largest in production and consumption of most high technology products and conventional industrial staples that include cars, cell phones, internet usage, personal computers, steel and television sets (National Statistical Bureau, 2006). Despite the western world generally regards China's institutions in corporate governance, finance and law as ill-suited and notoriously weak, the country remarkably and tremendously recorded spectacular growth and reduced poverty (Xu, 2011).

Industrial policy became dominant in China after establishment of State Planning Commission, an Industrial Policy Department in 1987 (Chang et al., 2016, p. 67). However, between 1981 and 1985 through to the sixth Five-Year Plan, (every five-year plan here is referred

¹⁶ China GDP Growth Rate 1961-2021. www.macrotrends.net. Retrieved 2021-04-05.

to as Plan), China made a paradigm shift from previous development plans. The plan was very comprehensive and outward-oriented, but also explicitly promoted FDI, which enhanced advanced technology acquisition and local capabilities building. Subsequent development plans were more specific and even aimed towards promoting R&D in high-technology industries and identifying industries with growth potentials (biotechnologies, advanced materials) and strategic to economic security (defence, civil aviation, electric power and grid). Government also provided preferential support to domestic strategic industries. It also used tariffs, non-tariff barriers and other measures to protect them from foreign competition. Just like Japan and South Korea, China developed large domestic industries and gave them targeted support and preferential treatment through local content requirements (LCRs) and subsidised loans to give them competitive edge over foreign ones. Chinese state banks also supplied industries with subsidised loans. For example, subsidised loans from the Export-Import Bank enabled Chery to expand into foreign markets, and credit support from local governments helped Geely to acquire Volvo Cars in 2010 (Marukawa, 2011).

However, the 12th Plan (2011-2015) took a regional developmental approach to strengthen roles of regional governments. government also ensured this by building a strong and mutual bond between public and private sector, strategically managing FDI, investing in skills development and science and technology, promoting and strengthening local innovation and directly supporting domestic industries and national companies (OECD, 2013, p. 108). The country built competitive industries that focused on capital accumulation and industrial upgrading, thus enhancing and maintaining growth for several decades (Lin, 2017). Thanks to these policies, Japan, Germany and USA were surpassed by China, who became the world's second largest economic powerhouse in 2009, largest exporting economy in 2010 and largest trading economy in 2013 respectively (Lin, 2017, p. 110). Furthermore, China's development policies have seen her lifting more than 700 million people out of poverty between 2014 and 2015, making her the country with the largest contribution (more than 70%) to global poverty reduction. If China's data on people living in poverty was not accounted in measuring global poverty, the world could not have experienced a dramatic fall in poverty.

China also leads in many areas and sectors. Firstly, it has the largest population in the world. Secondly, it is the biggest global cement, chemical fertilisers, steel and tomato producer and has the largest cotton textile output (Sawe, 2017). Thirdly, the largest foreign currency reserves

are in China (Xu, 2011). Fourthly, since September 2019 China host the world's biggest airport. Furthermore, China's automobile industry has the biggest production and sales capacity since 2009 and 2010 respectively. China's manufacturing sector was the biggest in 2018 accounting for 28% share in global output followed by USA with around 17% (Statista, 2020c). The sector is the largest contributor to China's GDP. Interestingly, among top ten countries with highest shares of global manufacturing output only China and USA had double digits. Moreover, in 2019 China's exports of manufactured goods as a fraction of total merchandise exports were more than 80% (UNIDO, 2019), and is the top among 10 largest manufacturers in the world after surpassing USA since 2010, who had held this distinct place for over hundred years (UNIDO, 2020a).

Examining China's automobile industry in detail can provide a better understanding of this remarkable transformation and growth, economically and industrially over the years. The industry is Chinese economy's pillar and largest globally since 2009. Additionally, China's economic growth is a strongly positively correlated to its automobile industry's growth, thus, as the automobile industry rapidly grows economic growth rate also rapidly rises. In 2018, the world exported motor vehicle more than any other product, and its exports value amounted to US\$775.2 billion, with 54.6% (US\$423.6 billion) belonging to European countries while Asian and North American countries accounted for 24.9 and 18.3% respectively (Radić et al., 2020, p. 74). Most countries that achieved rapid economic development through industrialisation and structural transformation targeted and promoted the automotive industry as one of the strategic industries due to its significant weight in the total economy and extensive linkages (backward and forward) to numerous other industries and sectors. Data from the World Integrated Trade System of the World Bank¹⁷ reveals that countries that are home to at least one vehicle model dominated the list of first five exporting countries in the world in terms of export value from 1988 to 2018. However, Hong Kong, a country without her own vehicle brand appeared on the list since 2012.

Economies of scale (firms need to produce a certain minimum level of vehicle units for them to develop and be profitable), strong linkages with other industries and entry barriers associated with high capital and technological innovations characterise the industry (Jan & Hsiao,

¹⁷<https://wits.worldbank.org/CountryProfile/en/Country/WLD/StartYear/1988/EndYear/2018/TradeFlow/Export/Partner/BY-COUNTRY/Indicator/XPRT-TRD-VL#>

2004). The automotive industry is capital-intensive, technology-intensive and has high-value-added. It is a classic example of an industry where LDCs can upgrade from merely employing simple labour-intensive skills to advanced labour skills, continuous and faster technological change; hence, it provides an interesting and better picture to judge industrial policy effectiveness (Natsuda et al., 2020, p. 2). The industry is high value, but generally incredibly competitive, thus it is a difficult area to enter because of high technology and innovation intensity, large-scale and system complexity, high budget requirements on R&D, and many actors.

It is manufacturing's or industrial sector's engine and catalyst of industrialisation, and has a huge multiplier effect on the economy due to its high degree of connectivity with many other industries such as aluminium, computer chips, copper, glass, plastic, semiconductor, steel, textile, tyre and upholstery (UNIDO, 2020b). Thus, what a country produces matters for industrialisation and development. The industry has strong multiplier effects to the whole economy and plays a catalytic role to enable trade and movement of persons, and develop transport industry (Nag et al., 2007). Studies show that a 1% growth in the industry in advanced economies increases GDP by 1.5%, that is, for every extra dollar investment in the industry raises GDP by 3% (Radić et al., 2020).

First, the production of auto requires inputs from other industries such as electronics, plastic, semiconductor, battery, coal, rubber and steel industries; henceforth the automotive industry induces investments in these upstream industries both domestically and internationally. Yülek (2018, p. 127) provides an extended size of backward linkages created and possible value-added generated by the automobile industry. Second, automotive production stimulates investment in certain downstream industries such as finance, fuel, insurance, maintenance, logistics and marketing, service and tyre industries. These are not inputs but used jointly with automobiles. Besides, the industry promotes growth of other industries and application of technology abilities in other industries, and increases employment opportunities and revenue generation in the economy (Humphrey, 2000).

Automobile industry's development process usually takes four phases. These are "importing completely built up automobiles, assembling completely knocked-down and semi-knocked down vehicles, assembling full vehicles and manufacturing complete vehicles, "(Tai &

Ku, 2013). Countries employ different policy strategies at each stage; LCR, import tax and quantity restrictions and ISI to develop and transform the industry. State intervention is critical for automobile industry's all development stages. Firstly, at initial stage, local firms lack industrial scale and productive capacity, thus state uses import substitution policy to help them to start producing key components and establishing supply chain. Secondly, local firms need some form of support to develop up to a minimum level of standard in the automobile industry's whole transformation stage until they can stand on their feet. Thirdly, domestic firms need support through quality control and unified development model so that they can export finished automobiles. Finally, through support domestic automobile manufacturers can establish automobile manufacturing plants or subsidiaries in other countries.

The industry is not just cardinal to manufacturing sector and economy through creating employment, generating foreign currency and serving human daily transport needs, but introduces new technologies, spurs innovation and reconfigures organisational methods and production systems (Ferrazzi & Goldstein, 2011). Owing to these benefits advanced and emerging countries have focused on developing the automobile industry and considered it economic growth and development driver (Athukorala & Kohpaiboon, 2010). The coronavirus is the latest episode that has demonstrated the significance of innovative for many sectors and industries, with top innovative companies performing strongly during the crisis, as they were able to slowdown the effects of the pandemic on their market share, sales, output and profits. The global automobile industry can similarly be ranked among top ten largest economies in the world in economic size (Ferrazzi & Goldstein, 2011). The industry is among industries that have largest investments in R&D, and several automobile manufacturing companies dominate the top 10 list¹⁸. Vehicle-manufacturing companies with high output and sales are the ones with constant technology upgrading and innovation readiness. The industry's success requires strong state intervention, reliable supply, performance and cost of the product, constant product quality upgrading and introducing innovative production techniques. Although these chiefly determine automobile industry's success, the world is increasingly becoming more civilised and factors like energy

¹⁸ <https://www.oica.net/category/economic-contributions/rd/>

saving, environment, particularly clean energy and resource recycling are quickly becoming important for the industry's success.

State has two options to transform and increase competitiveness of the automotive industry, and these are dependency development and independent development (Tai & Ku, 2013). Dependency entails state can rely on foreign investment and technology while independent suggests state can create and build own domestic industry. However, each approach has pros and cons. However, continuous use and upgrading of technology is critical for automobile industry's competitiveness and survival in the face of global restructuring.

The last two decades witnessed dramatic changes in global automobile. Most emerging economies had a rapidly expanding share of world automobile production. However, only few notable LDCs able to embrace technology upgrading, develop their motor industries and compete internationally. Contrariwise, global share of vehicle by traditional automobile manufacturing or producing countries such as Germany, Japan and USA, was relatively stagnant while that of others like France and Italy significantly decreased.

Today, many Asian economies including Japan, China and South Korea claim remarkable motor manufacturing companies and are among top global competitors in the automobile industry. Other countries in the region, notably Brunei Darussalam, Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam have lately established their names in the automobile industry. What makes studying the Chinese automobile industry more fascinating is that, unlike other major automobile manufacturing economies namely Germany, Japan and USA whose establishments involved capitalist principles, the Chinese automobile industry was born out of a command, communist economic system (Kenworthy et al., 2015).

3.2.1.1 Automobile Industry

China's automobile industry started in the 1950s, when its top politicians attempted to revitalise and transform the economy from agrarian to an industrial power through first Plan (1953-1957), which primarily focused on developing heavy industry, and among the industries targeted was automobile (Kenworthy et al., 2015). During its formative years, the industry primarily emphasised on catering for the needs of military and transport industries. Major reforms in 1978

saw the industry undergoing a raft of changes and growth phases. In the 1970s, Chinese automobile industry's productivity was very low (Chen et al., 2020), and by 1980 total vehicle production was just about 200, 000 units (Li et al., 2015). Owing to rising domestic demand and income in early 1990s and lower production costs, Chinese automobile industry gained momentum and attracted well-established foreign auto-manufacturers (Statista, 2020b). Initially, state-owned enterprises and local private enterprises were the only players in the industry, and this compromised production quality of automobiles. To enhance the industry's domestic capabilities and international competitiveness, government in 1994, promulgated a policy which allowed state-run automobile enterprises to partner with foreign enterprises, but foreign ownership could not exceed 50% (Li et al., 2015, p. 790).

Chinese automobile industry experienced different development phases. According to Gan (2003), there are four phases defining the evolution of the industry. The initial phase is from 1953 to 1965, followed by growth with periodic turbulence phase (1966-1980), and third is the adjustment and high speed growth phase (1981-1998) and lastly the growth and liberalisation phase (1999-2003). Kenworthy et al. (2015) claim the phases are start-up phase (1956-1978), growing phase (1979-2000), prosperity phase (2001-2010) and stationary phase (2011-2015). Between 1953 and 1965, the main actor investor in the industry was government. The Soviet Union played a big influence to the initial or start-up phase through offering technological support (Xi et al., 2009). Under the framework of technology cooperation China established First Automobile Works (FAW) in 1953 (Kenworthy et al., 2015). Until 1994, when government had an official policy that specifically targeted the automobile industry, there was no standalone policy for the industry.

China's WTO accession in 2001 was a huge policy transformation. This new chapter opened opportunities (new markets) and threats (international competition) for the Chinese automobile industry. Nevertheless, China treated the new adventure with kid gloves by strategically changing the emphasis of the industry's development from expanding productive capacity to enhancing industrial structure (Kenworthy et al., 2015). In compliance with WTO obligations, China introduced tariff cuts from 100 to 25% on all imported automobiles on a gradual basis for the period of five years (Chen et al., 2020).

Since 1999, China's automobile industry has been the fastest growing industry among 13¹⁹ well-established global automobile industries. In 2000, global automobile production was over 58 million units. USA accounted for approximately 22% (global highest output) followed by Japan (17%) and China on eighth position accounting for 4% (see Table 3.1). Between 2000 and 2005, China's vehicle production rose by a massive 176% while global average increased by only 14%. Japan's production rose by 6% while dropped by 6%. While global, Japan and USA automobile productions fell from around 91 million, 9 million and 12 million in 2015 to around 78 million, 8 million and 9 million in 2020 respectively, surprisingly China's production rose by over 700 thousand or 3%. China's average automobile production between 1999 and 2020 grew by 14%. This was the highest while the other fortunate countries like India, Russia, Brazil and South Korea registered single digit automobile growth rates. The growth of China's automobile industry was not by accident, but through careful planning and policy designing and implementation. According to Xi et al. (2009), local automobile firms took advantage of market-based and technological conditions, and government introduced policies that encourage partnership between local and well-established foreign car manufacturers and rules or regulations that addressed areas of technology and consumption.

Table 3.1: Vehicle Production for Selected Economies, 2000-2020

Economy Year	World		China		Japan		USA	
	Output	Δ (%)	Output	Δ (%)	Output	Δ (%)	Output	Δ (%)
2000	58, 295, 557		2,069, 069		10,144, 347		12, 799, 857	
2005	66, 465, 768	14	5, 707, 688	176	10, 799, 659	6	11, 980, 912	-6
2010	77, 583, 519	17	18, 264, 761	220	9, 628, 920	-11	7, 743, 093	-35
2015	90, 780, 583	17	24, 503, 326	34	9, 278, 238	4	12, 100, 095	56
2020	77, 621, 582	-14	25, 225, 242	3	8, 067, 557	-13	8, 822, 399	-27

Source: Author's calculations of data from International Organisation of Motor Vehicle Manufacturers (OICA)

Note: Δ (%) means percentage change.

¹⁹ The list comprise Brazil, China, France, Germany, India, Italy, Japan, Russia, South Korea, Spain, Sweden, UK and USA.

The global financial crisis of 2008 hit many industries and the automobile industry was not spared. Brazil and Russia (8%), China (5%) and India (1%) were among the winners, as they realised an increase in auto production, while production of other well-established automobile producing countries plummeted. Italy and USA experienced the worst as productions individually declined by 20%. Regarding sales units, Brazil (15%), Russia (11%) and China (7%) were the winners while Spain (30%), USA (18%) and the UK and Italy (13% each) were the biggest losers. For many countries, the crisis' aftereffects on the automobile industries only lasted for not more than two years, however, for Italy, it remained visible as both production and sales recovered six years after the crisis. As Table 3.2 reveals, the crisis did not only do injustice to automobile industries of individual countries, but to the world automobile industry. Italy, the UK and USA's automobile output and sales, and France and South Korea's output declined more than the world average. Nevertheless, USA has been leading in terms of total sales of commercial vehicles.

Table 3.2: Vehicles Production and Sales of Top Players

Country	Output (Units)		Sales (Units)		Change (%)	
	2007	2008	2007	2008	Output	Sales
China	8, 882, 456	9, 299, 180	8, 791, 528	9, 380, 502	5	7
France	3, 015, 854	2, 568, 978	2, 629, 186	2, 614, 829	-15	-1
Germany	6, 213, 460	6, 045, 730	3, 482, 279	3, 425, 039	-3	-2
Italy	1, 284, 312	1, 023, 774	2, 777, 175	2, 421, 918	-20	-13
Japan	11, 596, 327	11, 575, 644	5, 309, 200	5, 082, 233	-0.2	-4
Russia	1, 660, 120	1, 790, 301	2, 898, 032	3, 222, 346	8	11
S. Korea	4, 086, 308	3, 826, 682	1, 278, 624	1, 246, 086	-6	-3
UK	1, 750, 253	1, 649, 515	2, 799, 619	2, 485, 258	-6	-13
USA	10, 780, 729	8, 672, 141	16, 460, 315	13, 493, 165	-20	-18
World	73, 152, 696	70, 729, 696	71, 563, 399	68, 315, 495	-3	-5

Source: Author's calculations of data from OICA

While the automobile industry of big traditional players such as Germany, France, Japan, South Korea and USA were still reeling from the upshots of global financial and economic crisis of 2008, China's vehicle production and sales surged rapidly until hitting a high record in 2017. Necessitated by wanting to build industrial capacity and resuscitate their automobile industry's

growth, many governments responded to the financial crisis of 2008 and intervened through unprecedented levels of bailouts and subsidies. Chinese government specifically introduced three policies in 2009, which include, “Purchases Duty Preferential, Bring Auto into the Countryside and Car-scrapping,” Kenworthy et al. (2015, p. 47). It also ordered foreign and local automobile companies to do partnership by establishing R&D facilities, transferring technology to local firms, developing local brands of vehicles and including electric vehicles into their product range as means to build domestic capacity and new plants (Oh, 2014, p. 16).

Since 1999, China recorded extraordinary vehicle production growth rates in two episodes; 41% in 2002 and 48.3% in 2009. The industry also experienced significant sales growth in 2010, and this was 32.4% between 2005 and 2020. In 2010, China’s global vehicle production was 24%. With this output share, China became the highest global vehicle producer to surpass USA’s previous record of 23% in 1999. It also accounted for the highest sales in 2009, a position held by USA for decades. However, a huge fraction of China’s vehicle sales took place in the domestic market²⁰. Not counting 2012, China’s shares of global vehicle production and sales were greater than the shares of second placed (USA) and third placed (Japan) combined since 2010.

Between 2010 and 2020, China’s yearly automobile production approximately doubled Japan’s or USA’s annual production. Automobile output variation for 2020Q1 (January – March) and 2021Q1 for China rose by a whopping 82% while that of traditional automobile making countries namely Japan, France, Germany and USA fell. China’s automobile sales as a fraction of total sales by all Asian economies almost doubled from 33% in 2006 to 63% in 2020 and were the largest, while that of Japan tumbled by almost half from 26% in 2006 to 11% in 2020.

China’s automobile industry rapid growth is surprising given that the international market generally recognises Germany, Japan, South Korea and USA as traditional automobile producers and home to more valuable vehicle brands than those of China. However, since 2018 both vehicle production and sales have been falling, with the highest decrease recorded in 2019. Surprisingly, during COVID-19 pandemic, China’s production and sales in 2020 declined but not as huge as in

²⁰ <https://www.privacyshield.gov/article?id=China-Automotive-Components-Market>

2019. Furthermore, China's production and sales in 2020 dropped the least by 2% compared to South Korea and Sweden (11%), France (40%) and UK (29%).

Table 3.3: Top Vehicle Producing Countries and Manufacturers, 1999-2017

region	country	Data	
		Count of manufacturer	Sum of production
☐ America and Caribbean	United States	81	294977444
☐ Asia Pacific	China	304	124709958
Asia Pacific	India	50	19451143
Asia Pacific	Iran, Islamic Republic of	9	6992106
Asia Pacific	Japan	166	420012308
Asia Pacific	Malaysia	12	1564396
Asia Pacific	Russian Federation	63	15591193
Asia Pacific	South Korea	38	98243277
Asia Pacific	Taiwan, Province of China	3	283506
☐ Europe	France	39	110607547
Europe	Germany	83	223331409
Europe	Italy	19	56740814
Europe	Sweden	24	3597705
Europe	Ukraine	1	90548
Europe	United Kingdom	7	825702
☐ Other	Other Countries n.i.e. (IMF)	9	8161627

Source: Author's calculations of data from OICA

From Table 3.3, count of manufacturer is the number of times vehicle manufacturers of a particular country appear on the list of 50 vehicles manufacturers with the highest yearly output between 1999 and 2017. Sum of production is the total number of vehicles a country produced from 1999 to 2017. It is self-evident that Chinese vehicle manufacturers appeared the most in the list of 50 vehicle manufacturers with highest output followed by Japanese manufacturers. However, Japan produced the highest units (more than 420 million) followed by USA (295 million), Germany (223 million), China (125 million), France (111 million) and South Korea (98 million). Despite Chinese automakers appeared the most on the list of top 50 vehicle manufacturers, its total vehicle production ranks fourth in the world. This is because most Chinese manufacturers occupied the middle and lower ends of the top 50 while Japanese, American and German manufacturers occupied the upper end of the list. Moreover, Chinese automobile industry is younger than American, German and Japanese automobile which started production in the 1890s, 1870s and 1902 respectively.

China's first attempt to manufacture own vehicle started between 1928 and 1949. However, serious production never took place due to Japanese war. FAW manufactured the first Chinese vehicle in 1956, and in 1958, it produced the second vehicle. Since then, production increased continuously. Company-level analysis provides a vivid explanation and a better picture of Chinese automobile industry's performance. The industry has many players both wholly indigenous and joint ventures between local and foreigner vehicle manufacturers. Prominent names in the industry include BYD, Chana, Changhe, Brilliance Auto, Chery, Dongfeng, FAW, Geely, Great Wall Motors, Shanghai Automotive Investment Company (SAIC), and Beijing Automotive Industry Holding Corporation (BAIC). The "Big Five" Chinese automobile companies, which coincidentally are state-owned, include BAIC, Changan, Dongfeng, FAW and Shanghai General Motors (GM). BYD, Chery and Geely are indigenous car brands while BAIC, Dongfeng, FAW and SAIC are joint ventures (Li et al., 2015; Xi et al., 2009). However, only SAIC, Chana, Geely, Changan, Dongfeng Motors, BAIC and Great Wall managed to reach over a million units in a year, with Chana Automobile the first to do so in 2009. Its global ranking was 13 with 1, 425, 777M units of output. Since 1999, National Heavy Duty Truck of China, Jiangxi Changhe, Dongfeng Motor and Yuejin were the first Chinese vehicle manufacturers to be among leading 50 global automobile manufacturing companies. They ranked number 24, 27, 28 and 32 respectively.

However, only SAIC managed to produce the highest output in China, and that was in 2017 with an estimated output of 2.9M units. Furthermore, SAIC is the only Chinese vehicle manufacturer with better global ranking among Chinese vehicle manufacturers. Its position in the top 50 was number 12 followed by Changan and Geely, which held positions 15. The impressive performance by most Chinese automobile companies is attributed to their partnership with foreign vehicle manufacturing companies. For instance SAIC partnered with Volkswagen and GM (Li et al., 2015) and Hyundai, Dongfeng with Honda (Chen et al., 2020) while Geely and Volvo Car Group had a joint venture (Kenworthy et al., 2015). However, under the 2009 Automotive Development Policy, China permitted only foreign vehicle manufacturers to enter into a joint venture with a maximum of two Chinese vehicle manufacturers (Zimmerman, 2009). The policy also made it mandatory for vehicles produced or sold in China to receive a compulsory certificate only after meeting a certain level of quality, design and development capabilities and production consistency. The policy had stimulus packages and incentives to encourage vehicle ownership,

reduce tax on vehicle purchases mainly from independent local manufacturers and order government to procure new vehicle replacements from independent domestic manufacturers (Oh, 2014, p. 17).

Automobile industry is among key contributors to economic development through transportation (moving people, delivering goods and serving communities). However, the industry has implications on transportation sector and environment. The rising demand for vehicle and increasing usage led to expanding production of vehicles, which ultimately increased pollutants emissions and global warming. Studies show that transport sector at large urban transport in particular contributes to climate change, congestion of cities, global warming, air pollution and energy vulnerability (Kenworthy et al., 2015, p. 40).

Buses and minibuses, which are among most emitters of pollution, are the main mode of transport available for the public in many cities of LDCs. Studies estimate that vehicle emissions in LDCs cause about 90% of urban air pollution. Furthermore, China's automobile industry's rapid growth and vehicle ownership growth lead to rising air pollution, emissions, global warming and many other economic, environmental and social problems in the world (Chen et al., 2020). China realised that these problems are also a threat to herself, thus made efforts to decongest traffic on roads and promote citizens to use public transport. It also allows citizens in megacities, through bidding, to acquire new passenger vehicles on a quota basis through a lottery system or certificate of entitlement system.

The automobile industry's environmental impacts also made many countries to gradually take initiatives by enforcing stricter emission controls on new auto models manufactured. Environmental regulations also compel many automakers to expand towards electric cars. China is a leading player in the global automobile industry; whatever actions the country does in the industry has a huge global impact. To lessen pollutant emissions and save energy by mitigating the automobile industry's over reliance on petroleum, China also introduced a cocktail of measures for the industry namely; incentives, subsidies and tax exemptions that seek to promote new energy vehicles (NEVs) (Statista, 2020b; Yuan et al., 2015). Thus, addressing climate change, divesting from fossil fuels, increasing production and encouraging electric vehicle usage in major cities are

welcome developments and important steps toward improving air quality in urban areas and decarbonising the transport system.

China does not only promote NEVs²¹ to protect the environment, but also enhance her automobile industry's competitiveness against rivalries. Moreover, China took various initiatives to promote usage of cars with energy saving, less emission and pollution to enhance her automobile industry's capabilities and chances to leapfrog on new technologies and internationally promote domestic vehicle brands. It is also a requirement for all Chinese government departments to buy electrical cars. On 01 June 2010, government initiated a pilot programme in five cities namely; Changchun, Hangzhou, Hefei, Shanghai and Shenzhen as means to promote production and NEVs usage (Ferrazzi & Goldstein, 2011). The incentives comprised an amount of up to 50, 000 and 60, 000 renminbi for plug-in hybrids and private acquisitions of new battery electric vehicles respectively. These incentives were directly paid to automakers rather than giving them to consumers on condition that the prices of vehicles under the scheme would fall accordingly. The 13th Plan reaffirmed government's commitment to prioritise, promote and support the automobile industry, particularly NEVs manufacturing. The Plan supported technological innovation critical for manufacturing NEVs. Furthermore, government ordered electricity utilities to set up electric charging stations. These measures contributed to NEVs production and sales in China. In 2012, units were 12, 814 and 13, 053, in 2016 were 516, 590 and 506, 613 and in 2019 they were 1, 241, 850 and 1, 205, 961 units (China Association of Automobile Manufacturers [CAAM], 2020a). Despite COVID-19, China's electric vehicle sales was the biggest and it trebled from 1.2 million in 2020 to 3.4 million in 2021.

In April 2020 government further announced a decision to improve financial subsidy policy for the automobile industry aimed at supporting and promoting high-quality development, production and usage of NEVs (CAAM, 2020c). NEVs production and consumption declined in 2020 due to various factors, inter alia COVID-19, thus to promote consumption and healthy, high-quality and orderly NEVs development, government issued a notice in 2021 that extended fiscal subsidy policy until the end of 2022 (CAAM, 2021). Government promulgated a development plan (2021-2035) for NEVs, which seeks to promote technological innovation capabilities, build new

²¹ NEVs require technological advancement which is among the pillars to the automobile industry's growth.

industrial ecology, stimulate expansion of industrial integration, improve infrastructure system and deepen open cooperation of players in automobile industry (CAAM, 2020d). Government drafted a Technical Roadmap 2.0 document, which had six developmental goals that sought to reduce total carbon emission in the automobile industry by more than 20%, make NEVs the main vehicles in China, and establish smart vehicles and technological innovation in NEVs by 2035 (CAAM, 2020b). Acquiring a vehicle in China's megacities involves going through a mandatory quota and bidding system. However, during COVID-19 central and local governments relaxed these conditions in order to boost demand for domestic vehicles. Government even offered some form of financial stimuli to vehicle buyers of certain locally-produced models or brands (CAAM, 2020e).

3.2.2 Japan

Japan is the first Asian country to successfully grow through state support and industrial policy. It initiated the industrialisation process different from other Asian economies like South Korea and Taiwan, and was the first country outside North America and Europe to sustainably industrialise and modernise its economic growth (Perkins & Tang, 2017). Japan learned its industrialisation process from England and USA; however, its industrialisation circumstances were different from these two pioneers, but had something common with Germany.

Consequently, many other countries started to replicate or implement the Japanese development model, either in part or whole (Johnson, 1982). Japan's economic development took shape around 1950s and became vivid to many around 1960s. Nevertheless, several economic analysts and pundits, especially from the Western side, were very doubtful about this development's sustainability and longevity. They even wrote uncountable cautionary articles predicting Japan's growth to plunge and criticising the rationality of Japanese industrial policy designing and implementation. Surprisingly, Japan's expenditure in areas where doubters regarded as irresponsible, was like a miracle, and the country made remarkable progress in demand, industrial performance, productivity and savings (ibid). Japan's success was through activist developmental state and activist industrial policy. Some scholars attribute this success to a culture of consensus on national issues by political leaders, business and industrial leaders, government

leaders and elite people. This culture is associated with terms like Japan Inc., inbred collectivism, private collectivism, rolling consensus and spiderless cobweb (ibid, p. 8).

After 1634, Japan closed her economy to the outside world, save for Dejima island. After a failed agreement on first request in the 1850s, USA forced Japan at gunpoint to enter into a commercial intercourse. Japan acceded to USA's demands and signed various commercial and diplomatic treaties because she did not want to engage in war and her military was weak (Yülek, 2018). These treaties were beneficial to USA because Japan's exports comprised mainly agricultural and mining products while USA's exports comprised manufactured. However, Japan did not remain passive to forced liberalisation and the unfair treaties, but used focused policies to drive industrialisation process by starting to produce imported manufactured products and later export orientation. Japan's slogan for export orientation strategy was "*yushutu shinko, yunyu boatsu*", meaning promoting exports and restricting imports (Yülek, 2018, p. 89). Actually, the Meiji regime laid the foundation for success, and by 1912, Japan had relatively industrialised producing and exporting significant manufactured products.

At its peak of development, Japanese manufacturing sector targeted major industrial economic drivers. This prioritised heavy and chemical industries, followed by automotive and electronics industries. Japan's industrial policy emphasised on nurturing small and medium firms that were into automation and robotics, mechanics, material processing and engineering, and manufacturing sophisticated components (Andreoni, 2017). Nurturing involved a *keiretsu*²² system (an industrial pyramid system where a group of companies connect to each through investment and exchanging of personnel or a business network comprises different companies), provision of financial support and technical support from public sector (Johnson, 1982, pp. 307-308). Although *keiretsu* enterprises were key in the 1920s, small and medium enterprises accounted for most of Japan's export earnings (50-65%, which provide temporary relief to balance of payment deficits) and employed the highest share of country's industrial workers, thus Japan's industrial policy targeted to develop these enterprises (Johnson, 1982, p. 98).

In 1962, Japan approved the first development plan, which targeted developing 15 new industrial cities between 1964 and 1966. It published the second plan in 1969, whose emphasis

²² See Box 3.1 for more about Keiretsu.

was to continue with goals unfulfilled in the previous plan. By early 1970s, Japan was the second largest global economy after USA by economic size, and it surpassed UK, France and West Germany. Third plan was in 1977, and it focused on quality environments, and it supported industrial development plans. From 1989 to 2000, Japan rolled out fourth plan, which targeted industrial development in Tokyo and other areas.

Government worked tirelessly to engineer and instil a culture of entrepreneurship, investment and saving in the society. After Japan had agreed to liberalisation, foreign competition became a threat to domestic firms, and consequently, government started a rationalising industrial structure programme that sought to encourage mergers between domestic companies to consolidate their strength and increase their efficiency and international competitiveness (Okimoto, 1989, p. 13). When government could no longer properly manage investment, it started to help private entrepreneurs to build capital base and invest in areas that appeared to promote and strengthen military security and economic development. Government also sold underperforming state-owned enterprises to private sector, and the biggest beneficiaries from this deal were the *zaibatsu* that include *Mitsubishi*, *Mitsui*, *Sumitomo* and others.

Japan's developmental state is amazing and different from the Western type, in that economic development and planning ministries and agencies hire staff based on meritocracy and competence. They recruit talented and best graduates from best Japanese universities. Bureaucrats determine and dominate the decision-making and legislation process in Japan, whereas in USA, it is the parliament. However, decision-making and legislation drafting are done by elite bureaucrats in government who virtually make most major decisions in the economy, and upon retirement, they occupy influential positions in public and private corporations, politics and the banking sector (Johnson, 1982). In the 1920s and 1930s, achieving developmental goals not financial performance and profitability were the basis for rewarding managers in Japan. This was not the case in USA. Linking manager's performance to the company's profits affects long-term planning, growth of business and investment in new ideas, innovation and technology because doing so has a direct negative impact on manager's salary. This makes managers remain unwilling and hesitant to take risk. According to Okimoto (1989, p. 11) Japan uses anticipatory, proactive and preventive approaches to determine achieving industry-specific goals and deal with problems before they

Box 3.1: Group Enterprise (Zaibatsu and Keiretsu) as engine of Japanese Growth

Under Meiji regime, Japan collaborated with players in the private sector, preferably those who could hastily adopt new technologies and were ready to work towards strengthening the military and national development goals (Johnson, 1982). Government maintained close ties with private or family-owned industrial enterprises or empires (*zaibatsu* in Japanese). Japan's victories against China and Russia through a strong army were enablers to her supremacy and expansion in Asia. Government encouraged *zaibatsu* to venture into areas where it most needed development. The *zaibatsu* were the pioneers to commercialise modern technologies in the country, and they made tremendous achievements in banking and manufacturing sectors. The first *zaibatsu* to exist was *Mitsui* and that was in 1876. In subsequent years, other three *zaibatsu* namely *Mitsubishi* (engaged in heavy industry and shipbuilding, and also into mining, banking, insurance, brewing, trade and shipping), *Sumitomo* (specialised mainly in banking and metals) and *Yasuda* (focused on banking) (Poland-Asia Research Centre, 2009). These *zaibatsu* continued to grow until each had a controlling stake in at least one manufacturing sector, banking, insurance, shipping and trade. They had monopoly over certain industries and whole Japanese economy.

After Second World War, American forces wanted to make Japan less powerful by dissolving *zaibatsu* as they were behind Japan's military power. In 1948, Communism was fast spreading in parts of Europe and Asia, and a cold war had started in Europe. American aid in Asia during that time was explicitly to fight Communism in the region by developing productive capacities, technology and infrastructure, and supporting large-scale firms and land reform programmes to strengthen economic and military prosperity and maintain political stability of American allies (Wade, 2009).

occur, whereas USA uses ad hoc and reactive approaches, which are not industry-specific, and tend to deal with problems after they occur.

USA was against Communism and seriously needed a strong Japan to make her a strategic buffer to counter Communism. As such, USA stopped dissolving *zaibatsu*, but modified the old *zaibatsu* to create new *zaibatsu* called *keiretsu*. The modification process created *Keiretsu*, including; *Daiichi-Kangin, Fuyo, Mitsubishi, Mitsui, Sanwa* and *Sumitomo*.

A *keiretsu* can take a horizontal or a vertical form (Grabowieck, 2006; Poland-Asia Research Centre, 2009). Horizontal *keiretsu* are conglomerates that are independent and operate at the same level in completely different industries, but linked to each other through cross-shareholding and intra-group financing and their businesses complement each other e.g., a bank or insurance company working with a manufacturing industry. Vertical *keiretsu* are those *keiretsu* closely related and operate at different levels, but in the same industry e.g., a car assembler and various suppliers of its components. *Keiretsu* were an outstanding feature that strengthened and transformed Japanese economy. Government and *keiretsu* had a close relationship. However, bureaucrats still made decisions on economic growth without forcing the enterprises to take them, but those that responded positively got incentives like tax breaks, ease access to capital and so forth. The idea to promote *keiretsu* paid dividends, as these *keiretsu* were much involved in Japan's industrialisation and economic development. They enhanced Japan's economic growth, structural upgrading and closed Japan's productivity and technological gap with advanced economies (Grabowieck, 2006). Although the concept of *keiretsu* drew sharp condemnation from USA, it was key in reducing coordination failures in investment areas where individuals were not willing to venture because of high risk.

Source: Grabowieck (2006); Johnson (1982) and Poland-Asia Research Centre (2009).

To enhance technological infrastructure, Japan established *Kohsetsushi Centres* in 1902 at both regional and national levels according (O'Sullivan et al., 2013). This concept mimicked USA model and system, which established agricultural extension offices and engineering experimentation stations. According to Johnson (1982, p. 16), Japan imported most technological requirements for basic and high-growth industries from USA, and this was central to industrial policy. Japan's international trade and industry ministry (MITI) regulated technology entry to

stimulate industrial development (ibid). MITI was irrefutably crucial in transforming Japanese economy during the early years after war, and this even inspired other Asian economies including South Korea and Taiwan to adopt a developmental state in implementing industrial policy and managing development strategies (Subagyo). Through effective industrial policy, MITI tailor-made measures that fit the needs of various types of industries (sunset - structurally depressed ones, and sunrise - rapidly growing ones) (Okimoto & Rohlen, 1988, p. 173). MITI steered industrial policy (*sangyō seisaku*) and laid down the requirements²³ to companies with privileges to preferential treatment.

However, Japanese industrial policy success was not exclusively through MITI's vision, but also through political system, strong private sector, sociocultural factors and strong relationship between MITI and political leadership (Okimoto, 1989). The political support especially from the Liberal Democratic Party was probably one of the greatest assets to MITI. It gave MITI the leeway to circumvent complications arising from legislation and politics, and also made state intervention very effective by providing administrative guidance and consensus formation (Okimoto, 1989, p. 18). However, there are failures that MITI encountered during industrial policy designing and implementation processes. It failed in petrochemical industry in the 1970s and textile industry (Okimoto, 1989, p. 6). Other problems like economic bureaucracy, economic crisis, political interference, lack of coordination among ministry officials and war affected Japanese industrial policy formulation, particularly at its formative stage.

Government also set up a development bank, which targeted certain sectors and industries. The financing structure resembled Germany's, where the Japanese Development Bank, government and other public financial institutions provided long-term loans to industries. through this framework, Japan implemented and pursued many policy initiatives that spur industrialisation and structural transformation.

Japan also formulated key developmental goals and targets namely; increase industrial production (*shokusan kōgyō*), rich country, strong military (*fukoku-kyōhei*), expand productive capacity (*seisanryoku kakujū*), promote exports (*yushutsu shinkō*), full employment (*kanzen koyō*) and high-speed growth (*kōdo seichō*) (Johnson, 1982, p. 20). Thanks to industrial policy and

²³ Building domestic technology and capabilities and withdrawing support if fail to comply.

industrialisation, Japan achieved substantial growth rates, output and income and trade surpluses with Europe and USA between 1950s-1970s (high-speed growth period). Rising trade surpluses prompted some European countries and USA to pressurise Japan to appreciate the yen. Under the Plaza Accord in 1985, France, Japan, West Germany, UK and USA agreed to depreciate the American dollar against yen and German mark. This meant to boost competitiveness of exports from European countries and USA vis-à-vis Japan's exports.

Japan's industrial policy journey also had two key aspects, namely; "industrial rationalisation policy (IRP) - *sangyō gōrika seisaku*" and "industrial structure policy (ISP) - *sangyō kōzō seisaku*", (Johnson, 1982, p. 27). IRP required the state to know in detail what individual enterprises were doing for purposes of either improving or abolishing operations of an enterprise. Japan also learnt from Germany's IRP, whose focus were to build technological innovation in industries, sponsor cartels and trusts through government support, increase efficiency and modernise operations through cutting-edge equipment. Japan's IRP also increasingly underlined cooperation as opposed to competition among enterprises, and obliged enterprises to focus on lowering costs as opposed to making profits. Japan used IRP to leapfrog from international backwardness. It made improvements in technology, industrial location, facilities, industrial organisation and management areas. Government was also supportive of education, particularly in engineering and other technical fields, and it even provided opportunities to students and staff in certain professionals to study and learn abroad (Yülek, 2018).

ISP focused on proportions or contributions of each sector (agriculture, manufacturing, mining and services) in the economy. Within the manufacturing sector, IRP's purpose was to alter manufacturing's composition or structure, that is, for the sector could be heavy or light industry, labour-intensive, knowledge-intensive or capital-intensive provided it benefited the nation. Government played a crucial role to industrialise the country (Yülek, 2018, p. 92). Firstly, it directly involved in heavy industries as a manufacturer or producer using already established state-owned enterprises. Secondly, it indirectly involved by encouraging private sector participation in manufacturing and provided them with material inputs, technology, training and production management and promised them to benefit from official procurement.

Today, Japan is among global economic powerhouses. Its products are high-technology intensive, good quality and almost found in every country, yet they were once of poor quality and cheap. Japan's industrial development journey goes hand in glove with the development of her automobile industry. Moreover, Japan's export performance is highly dependent on the automobile industry and the electronics industry. Thus, to get the gist of Japan's development strategies and trajectory, it is proper to examine developments in automobile industry and government policies towards this industry.

3.2.2.1 Automobile Industry

Japan established its automobile industry later after that of America and Europe, yet today is world's second largest automobile producer after China and has the largest total automobile output and sales since 1999. Japan produced first automobile in early 1900s. However, developing one seemed unsurmountable task to both business and government officials due to Europe and USA's dominance in the industry during those times. Total production was a mere 458 units in 1930, consisting only of trucks and buses, but after introducing passenger vehicles in 1936, output jumped to 12, 186 (Tsuji, 1959). In 1946, production was 15, 000 units, and by 1990, it had surpassed 13 million (Nishijima, 2012).

Between 1942 and 1945, production sharply declined from 21, 762 in 1944 to 8, 187 in 1945 (62% - worst in Japan's automobile production history). The decline was greatly contributed by damages on factories and raw materials scarcity (Tsuji, 1959). However, production peaked in 1946, and by 1956, it passed the 100, 000-vehicle mark. In 1947 and 1948, exported were only two and seven units respectively, but in 1949 and 1950, they jumped to 508 and 5, 494 units respectively. MITI introduced protection and cultivation policy in 1951 that set the country's vision for national cars, import restrictions, investment protection and other policies to stimulate automobile industry growth (He & Bai, 2012).

By end of 1957, exports were 25, 973 units comprising 15, 450 vehicle sales abroad and 10, 523 sales locally in foreign currency to foreign personnel (Tsuji, 1959). However, the industry was not competitive and quality of Japanese automobile was very poor, despite authorisation by government, particularly the "Big Three", Isuzu, Nissan and Toyota to produce military vehicles after restricting GM and Ford's industrial operations in 1930s (Cusumano, 1984). After decades

of learning, the “Big Two” (Nissan and Toyota - who account a lion’s share of Japanese automobile industry) succeeded to manage technology, and design and manufacture better vehicle models. In 1976, Japanese automobile industry topped the industry contributing around 9% domestic manufacturing industry’s total output value. Since 1978, this share was more than 10% and also, around 10% of Japan’s total labour force worked in automobile industry. The industry maintained these shares for quite some time, thus, ending up getting the moniker²⁴ “10% industry”. By early 1980s, the industry had established and was one of the highly competitive and productive auto industries in the global. The industry contributed more to Japan’s economy than what USA’s industry did to her own economy, and for every 10 workers in the industrial sector one belonged to the automobile industry (Hara, 1980).

Between 1980 and 1993, Japan was the global leading auto producer, after overtaking USA in 1980. However, from 1994 up to 2005, USA redeemed the leading position. Nevertheless, Japan regained top position in 2006 but only for three years, and China became the new leading auto manufacturer. Toyota vehicle recalls that happened between 2009 and 2010 greatly affected not only Toyota’s production and sales but also Japan’s automobile industry because Toyota is the largest auto manufacturer in Japan. Again, in 2011, the *Tōhoku* earthquake and tsunami greatly affected automobile industry’s production.

Japan’s automobile industrial did not develop automatically, but government nurtured and ring-fenced it with sunset clause protection using import quotas, tariffs and controlling FDI in the industry and providing soft loans through Japan Development Bank. Government gradually lifted import quotas for buses and trucks in 1960, passenger cars in 1965 and engines in 1972, and reduced tariffs to 10% from 40% in 1971, to 5% in 1973 and to 0% in 1978 (Nishijima, 2012, p. 86). Japanese automakers also subcontracted *Keiretsu* to supply them with auto parts and components, and they (*Keiretsu*) in return got substantial preferential support from MITI.

Japanese production systems, just-in-time and lean manufacturing in particular, focused on streamlining production by eliminating wastes not only greatly influenced the Japanese automobile industry, but brought a paradigm shift from America’s mass production system, helped resuscitation of Western auto manufacturers and created huge impact and footprint on global

²⁴ <https://carfromjapan.com/article/industry-knowledge/development-history-japanese-automotive-industry/>

automobile industry (Shimokawa, 2010). Differences in production system between the West and Japan, particularly USA also resulted in productivity gap between the two sharply rising in the 1980s, and Japan fast closed the gap. Even in 2008 when other countries were reeling from financial crisis, Japan still produced the largest units of vehicle followed by China and USA.

Toyota pioneered lean manufacturing, and focuses on identifying and minimising wastes linked to production, management and supply chains processes and simultaneously improving quality, reducing costs and speeding up production (Thornton, 2010). Between 2008 and 2017, Toyota was the leading global automobile producer, a position GM had held since 1999. Toyota holds a record as the global largest vehicle producer in 2014 and 2017 (10.5 million annually). Toyota and Volkswagen dominated the list of top ten companies with the highest vehicle output between 1999 and 2017.

3.2.3 Malaysia

Malaysia's industrialisation started with ISI in 1950s and later EOI in 1970s. Industrialisation process and industrial policy underwent various episodes that comprise extensive state intervention, establishment of export processing zones (EPZs) and heavy industrialisation in 1980s (Jomo, 2007). However, heavy industrialisation initially failed because Malaysia encountered severe recession in the mid-1980s and state intervention through state-owned enterprises resulted in massive losses (Gustafsson, 2007). active industrial policy coupled with numerous incentives targeting exports, FDI, R&D and skills development contributed to industrial policy success (Lall, 1995; Rasiah & Shari, 2001). Industrial policy broadly comprised fiscal incentives as instruments to promote manufacturing sector growth, but targeted manufactured exports growth (Doraisarni & Rasiah, 2001). Equally important were selective interventions and conditional investment incentives by government, which largely influenced Malaysia's industrial policy and manufacturing sector growth albeit economic instability during Mahathir era (Gustafsson, 2007; Jomo, 2007). Consequently, percentage of manufactured products from total exports grew to 71% in 1993 from only 12% in 1970 (Lall, 1995). Also, exports to GDP ratio rose to 95% in 1995 from 46% in 1970 (Athukorala & Menon, 1999).

World Bank statistics reveal that Malaysian economy had magnificently transformed from a poor income country that heavily depended on primary commodities in late 1950s to a

middle-income industrialised country. Also, Malaysia's manufacturing sector accounted for close to 60% of total merchandise exports in 2012, and 45% of its manufactured exports, which comprised high-technology products (WTO, 2014). To influence firms' attitudes towards industrial development plans, government applied general policies including carrots-and-stick measures, that is a combination of rewards and penalties comprising tax exemptions and public procurement to reward or punish firms (Altenburg, 2011).

In 1986, government replaced New Economic Policy with New Development Policy replaced the, and in this new policy government attempted to develop the automobile and chemical industries. Consequently, between 1986 and 2020, government introduced three Industrial Master Plans (IMP) namely; IMP1 (1986-1995), IMP2 (1995-2006) and IMP3 (2006-2020), to promote development of sectors deemed economically strategic (Chang et al., 2016, p. 85). Each Master Plan focused on promoting and strengthening technological advancement and stimulating R&D through technical support and skills development and training. Government availed a soft loan policy to enhance quality in the automotive, electrical and electronics, engineering, food, furniture, machinery, plastics and textile sectors (ibid). Among successful industries Malaysia's industrial policies targeted are palm oil industry and electrical and electronics industry, hence exploring them provides a better understanding of Malaysia's industrialisation process.

3.2.3.1 Palm Oil Industry

Extraction of cooking oil from oil palm trees originated from Western and Central Africa. Nevertheless, today East Asian countries are leading in palm oil production and exportation more than Africa. Thanks to good climate and good policy implementation like product diversification, value addition and technological advancement, Malaysia is now among leading palm oil exporters and producers. It surpassed Nigeria in 1966 and 1971 as leading exporter and producer respectively (Gopal, 2001). When government launched IMP1, the palm oil industry had already flourished and was the country's leading export earners and important agricultural commodities. Today the industry is a foreign currency earner, and its export proceeds are very useful to Malaysia's endeavour to diversify from resource-based and comparative-advantage-complying industries such as palm oil, tin and rubber to comparative-advantage-defying industries like electrical and electronics.

Government introduced policy measures that encouraged palm oil production. Since 1962, government availed grants to rubber farmers who volunteer to replace old rubber trees with oil palm plantations. It also took control of plantations owned by foreign companies because law required them to surrender major part of their shares to government (Pletcher, 1991). Furthermore, through an Investment Incentive Act oil palm firms that met the minimum criteria for capital investments and export performance got two years corporate tax exemptions and tax break in excess profit and development for a period of eight years since 1968 (Rasiah, 2006). Exporting crude palm attracted higher duties while exporting processed palm oil had tax exemptions. These incentivised palm oil processors to upgrade their industrial and technological capabilities, thus making them competitive (Jomo & Rock, 1998). By 1994, Malaysia had refined its crude palm oil by 99% compared to just 10% in 1975 (Gopal, 1999). Thus by 1977, crude palm oil exports had been surpassed by processed palm oil. No palm oil exports in 1970, but in 2002 the quantity exported was 9.7 million metric tonnes (Gopal, 2001; Rasiah, 2006).

Government provided investment incentives to strategic sectors highly linked to palm oil processing. To build local production capabilities and ensure consistent supplies, government subjected bleaching earth²⁵ to import quotas and high tariff duties and (Chang et al., 2016, p. 87; Rasiah, 2006, p. 173). Government subsidised domestic production of bleaching earth to make the costs and supply of locally produced more affordable and sustainable than imported one. In 1992, government introduced “Palm Oil Credit and Payment Arrangement (POCPA),” a two-year credit and payment scheme to importing countries of Malaysian palm oil (Chang et al., 2016, p. 88). POCPA facility allocated US\$500 million in 2002 to palm oil industry to enhance exports competitiveness (Gustafsson, 2007). Between 2000 and 2012, Malaysia accounted for 55% of global palm oil exports, and was the second largest palm oil producer behind Indonesia in 2012 Malaysian Palm Oil Council ([MPOC], 2019).

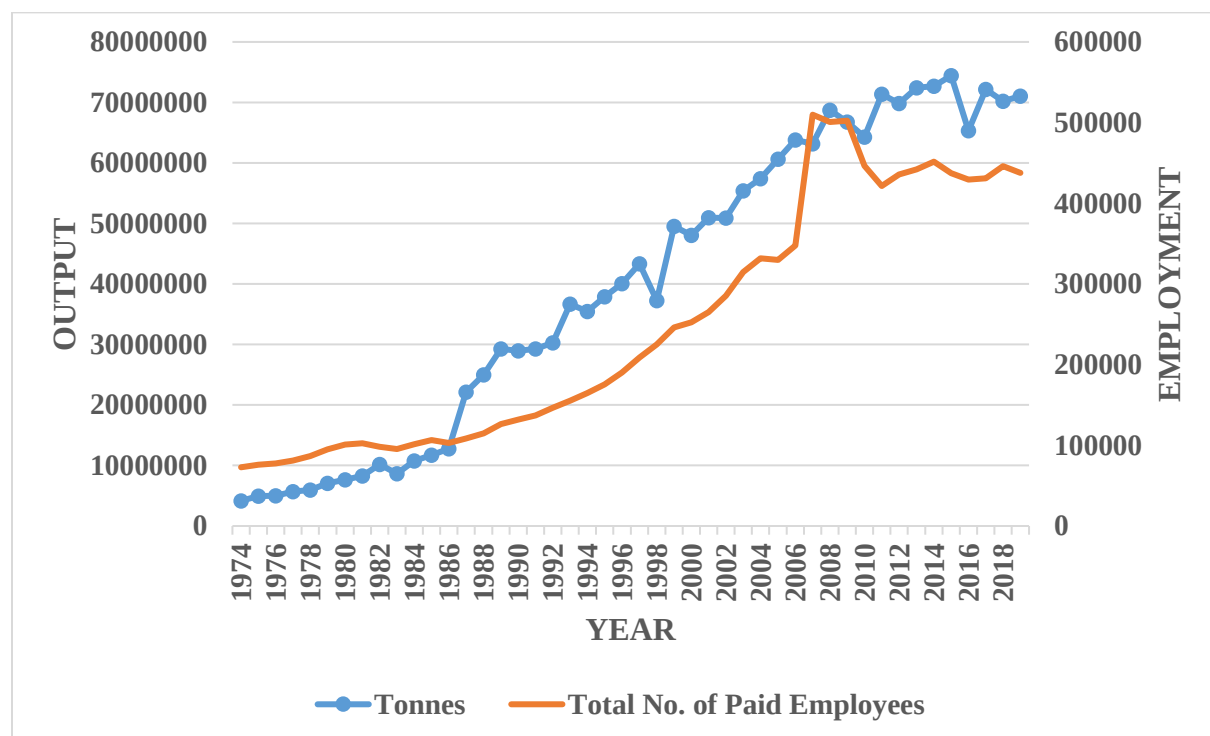
Through extensive government support and R&D, the palm oil industry managed to step up efforts for value addition and beneficiation, diversify and expand into other sectors, and developing new products. The industry’s transformation was possible through firm or product level

²⁵ Bleaching earth is among key component to the palm oil processing industry and it accounted around 40% of the costs related to palm oil processing in 2000.

developments, sound policy measures and institutional support, strong networking and coordination among players (Rasiah, 2006).

Malaysia is an important global player in palm oil industry. It is the largest producer and trader of edible oils. As Figure 3.1 shows, between 1974 and 2008, both employment and output steadily increased. However, in 1998 output dropped maybe due to financial crisis of 1997 in Asia, but it rose above pre-crisis levels.

Figure 3.1: Employment and Output in Palm Oil Industry, 1974-2019



Source: Malaysia' Department of Statistics²⁶

The Master Plan (2012-2020) aimed at developing SMEs and upgrading the manufacturing sector through leveraging FDI. Government deliberately picked, prioritised and promoted palm oil, thanks to its strong backward and forward linkages, which range from crude oil, refined oil and kernel oil. Besides, government chose palm oil because it is beneficial to health and a useful source of energy. Government also actively developed downward industries such as

²⁶

https://www.dosm.gov.my/v1/index.php?r=column/ctimeseries&menu_id=bnk3bk0wTTkxOXVHaVg3SUFDMIBUUT09

biodiesel, biomass, biotechnology, oleo-chemicals and palm oil processing industries that are highly connected to the palm oil industry.

Palm oil growth is incredible, and since 2000, is among most global important vegetable oils. Since 2006, palm oil remains the world's largest source of vegetable oil, followed by soybean oil, rapeseed oil and sunflower oil (Barthel et al., 2018). It constituted roughly 30% of global fats and oils in 2020. About 40% of Southeast Asia's palm oil harvest comes from smallholder farmers, thus the industry contributes to livelihood and rural development (ibid).

Indonesia and Malaysia contributed over 80% of world's palm oil output and exports between 2018 and 2020²⁷. Indonesia followed by Malaysia, produces and exports over 50% of global palm oil. However, palm oil of Malaysian origin is almost found in every country, and in 2020 China, India, The Netherlands, Pakistan, Philippines, Turkey, USA, Vietnam, Italy and Kenya were Malaysian palm oil's top ten export destinations. The combined share of China and India's palm oil imports from Malaysia stood around 30%.

However, the industry still faces challenges. Malaysia is receiving unfair treatment from some European countries who are considering imposing protection in EU market. The EU is enacting laws to ban the consumption and usage of palm oil products, biofuels and its related products because they believe palm oil production contributes to or promotes deforestation, loss of biodiversity and other environmental damages (Barthel et al., 2018). The EU pledges not to leave a global environmental footprint related to palm oil.

EU is using various measures to discourage consumption and usage of palm oil from Malaysia. These include EU Delegated Act, "No Palm Oil or Traffic Light" label, EU Green Deal, anti-palm oil and palm oil biofuel lobbies, EU's Deforestation²⁸ and Free Farm to Fork and Nutri Score. Government organises programmes like "Palm Oil Trade and Seminars²⁹" and "the Love

²⁷

https://ipad.fas.usda.gov/cropexplorer/cropview/commodityView.aspx?cropid=4243000&sel_year=2018&rankby=Exports

²⁸ In the EU report on environment activities to do with palm oil and palm oil-based biofuels production were cited as majors causes of deforestation.

²⁹ The event has been successfully held annually since 2006.

My Palm Oil Campaign” to counter campaigns against palm oil, market and promote use of palm oil from Malaysia and palm biofuels (MPOC, 2019). Among oil-bearing crops or plants, oil palm requires the minimal land (only 0.26 hectares) to produce a tonne of palm oil, yet to produce the same output from rapeseed, sunflower and soybean requires 1.52, 2.0 and 2.22 hectares respectively (ibid).

Moreover, government is working to ensure compliance and adherence to certified and sustainable production practices and minimise too much reliance on foreign labour in the industry. The COVID-19 pandemic affected hotels, restaurants and cafes or commonly referred to as HoReCa sector, and eventually affected palm oil industry because palm oil is widely used by hospitality and catering industry. However, to boost output of palm oil and reduce severity of agonies caused by COVID-19, from June to December 2020 government introduced 100% export duty exemptions on crude palm kernel oil, crude palm oil and processed palm oil. Furthermore, COVID-19 affected labour supply in the palm industry, since most foreign workers and immigrants, who constitute the bulk of labour supply in the industry, were affected by COVID-19-related travel bans. Palm oil production plunged by approximately 20%. Government responded by investing additional funds, cutting product taxes and increasing labour demand by a gap of 50, 000 workers.

Government abolished export duty levied on crude palm oil, thus progressively leading to palm oil prices increasing by 73% from Malaysian Ringgit 2, 074 to 3, 600. Crude palm oil price reached the highest level in palm oil history in 2021 (4,407) despite a decline in exports. Government further introduced a 350-million-ringgit microcredit financing scheme to agro-entrepreneurs, which would be payable at an annual interest rate of 3.5%. The effort paid off, and created business opportunities for players to expand output or venture into other products such as pharmaceutical related products³⁰.

Government also strives to ensure sustainable production for every drop of palm oil. Starting in January 2020, government promoted sustainable palm oil by issuing mandatory certificates to oil palm farmers and palm oil producers. By end of 2020, about 86% of the hectares of oil palm plants and close to 90% of the palm oil mills received certificates and approvals.

³⁰<https://vepimg.b8cdn.com/uploads/vjfnw/2576/content/images/16103283202-datuk-ravi-pdf1610328320.pdf>

Government ensures sustainable palm oil production through five pillars namely; people (protecting employees and stakeholders' rights), planet (protecting environment and reducing environmental impacts), prosperity (following best practices to ensure business continuity), peace (fostering inclusive, just and peaceful societies) and partnership (embracing a solid global partnership)³¹. Government also limited cultivating palm³² land size, banned conversion of permanent forest reserved area for oil palm cultivation, barred cultivation of new oil palm trees in peatland³³ areas, demonstrated transparency in the supply chain and made oil palm plantation maps accessible to public. Government is dedicated to improving productivity and yield beyond through land expansion, but through using better seedling from Genome technology, automation and mechanisation as well as formulating and applying efficient pest and disease control systems and efficient fertilisers.

Since 2021, government focused on areas that guide palm oil industry development and growth in the next decade³⁴. These key areas include:

- Productivity - to accelerate R&D, collaborations, and application of innovation and technology particularly in harvesting activities where there is a shortage of labour.
 - Sustainability - to encourage sustainability in production and consumption across palm oil value chain.
 - Inclusiveness – to promote fairer wealth distribution.
 - Value-creation - to allow more investment in downstream sector, new product applications and product diversification, and
- Market development - to leverage the global supply chain.

3.2.3.2 Electrical and Electronics Industry

Electrical and electronics is another important industry that has immense contribution to Malaysian's manufacturing sector, economic growth, export earnings, employment and

³¹<https://vepimg.b8cdn.com/uploads/vjfnew/2576/content/images/16103283202-datuk-ravi-pdf1610328320.pdf>

³² A cap of up to 6.5 million hectares on the total oil palm cultivation was put in place.

³³ An area with high carbon stocks and also provides habitat to a number of threatened species.

³⁴ This section benefited immensely from virtual presentations at the Palm Oil Trade and Seminar held between 5 and 8 January 2021.

investment. Government support to the industry began in 1965 by introducing a programme intended for substituting household appliances and electrical imports. Matsushita Electric, a Japanese owned firm, used the incentives and started to supply local market with final electrical consumer goods. Government further extended other incentives like R&D and training, duty drawbacks and subsidies to export firms that were specifically designed for this industry. It concluded several technology transfer agreements, but also took an active intervention and supportive role to ensure transfer of advanced technologies to the industry. However, the industry still needs to embrace technological upgrading quickly, particularly in R&D, designing, development and prototyping of integrated circuits so that it can compete with same industries in developed markets. Government in 1971, introduced general incentives comprising establishing an export zone, offering tax exemptions, and allowing and guaranteeing repatriation of profits to firms setting up plants in Malaysia. By 1972, Malaysia had started exporting electrical and electronics. Also, by early 1980s the industry had established into a leading contributor and generator of Malaysian manufacturing sector's employment and export earnings (Rasiah, 2010). Malaysia's electrical and electronics exports value vis-a-vis her top export destinations (China, Hong Kong, Japan, Singapore and USA) in 2014 was US\$63 billion, representing about 49.2 and 32.9% of manufactured goods exports and total exports respectively (Chang et al., 2016, p. 88).

East Asians, particularly NICs' industrialisation journey was gradual. Studies show that they started by venturing into exportation of relatively low-technology products such as footwear, garments and toys. In contrast, Malaysia defied this and started to venture directly into exportation of electrical and electronics, an industry with products that require relatively high skilled and technologically advanced processes. However by 1980 and 1990, manufactured products exports in high-skill class was 73% and 84% respectively (Lall, 1995). As Table 3.4 illustrates, electrical and electronics exports' share of total manufacturing exports jumped from 2% in 1973 to 73% in 2000 respectively.

Table 3.4: Electrical and Electronics' Manufacturing Exports Share, 1968-2007

Year	1968	1973	1979	1985	1990	1997	2000	2007
Percentage	0.7	2.1	28.4	52.1	56.6	66.5	72.5	60.7

Source: Rasiah (2010)

The structure of this industry encompasses front and back end. The front-end entails conceptualisation, designing, development and prototyping of integrated circuits or chips. These chips are further sent to expensive fabrication facilities for mass fabrication. The back-end entails packaging and staking of wafers that get connected to various technologies. It is characterised by low-technology, low-skilled and low-value-added products. The front end has higher returns than the back end, but is more challenging and competitive. Furthermore, it requires high technology, skills and enormous investments, thus it belongs to high-value-added activities. Malaysia has extremely done well in the back end of this industry. Nevertheless, it must do more in the front end. Generally, the industry has more foreign owned firms than locally owned ones, but majority in both categories dominates the back end. Moreover, fewer locally owned firms than foreign owned ones occupy the front end (Rasiah, 2010).

There are various reasons why the industry is failing to develop. Firstly, research universities and laboratories lack capacity to invest in frontier R&D due to supply gaps in skilled professionals such as engineers and scientists, thus hampering the industry's ability to upgrade to the front end (Rasiah, 2017). Also, the industry heavily relies on foreign investment and low-skilled, and low-paid foreign labour force, thus contributing to lack of development (Raj-Reichert, 2020).

Through industrial policy, government actively intervened in electrical and electronics and palm oil industries to ensure economic growth. The intervention involved restructuring and redesigning industrial policy and offering incentives of varying degrees to allow local capabilities transfer and technology building. However, Malaysia still needs to localise technology to enable domestic firms to participate in higher-value-added and high-skilled manufacturing activities.

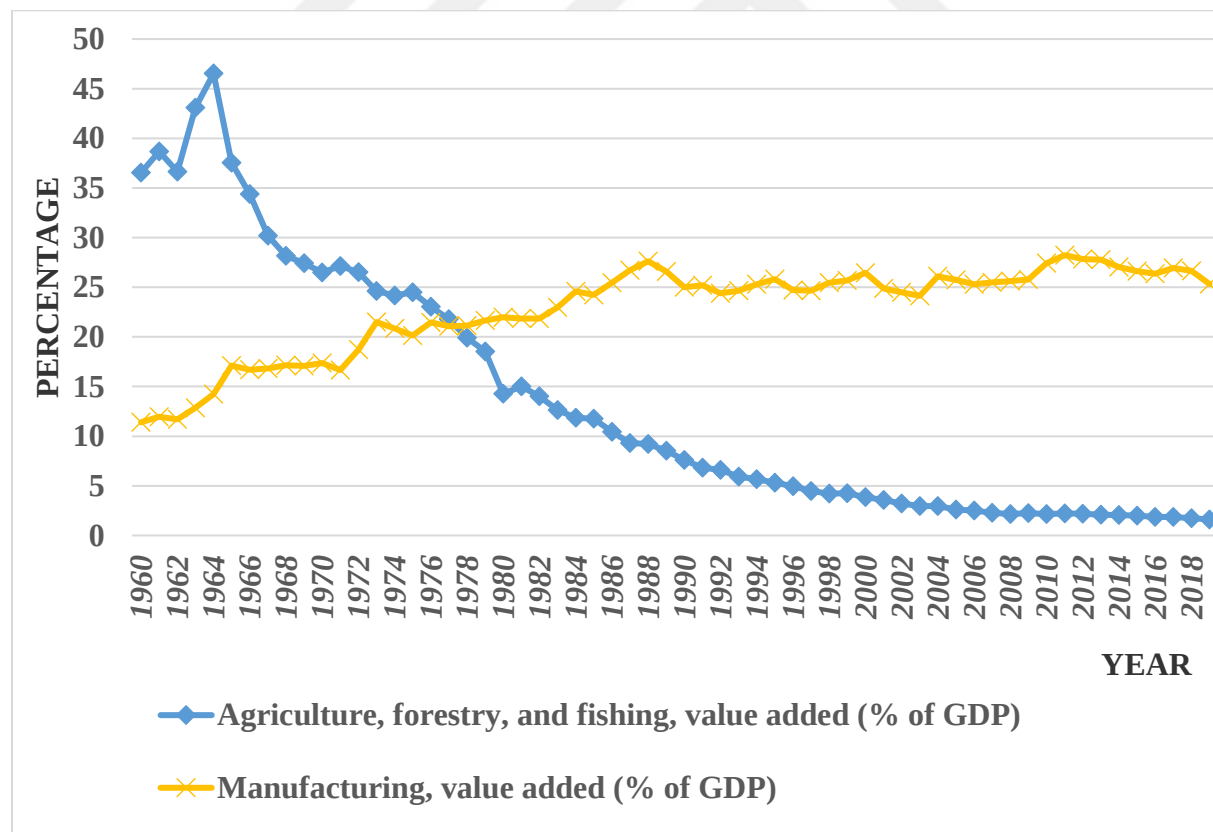
3.2.4 South Korea

South Korea's technological development and upgrading during early stages of development involved importing technologies followed by imitation and reverse engineering the same technologies (Kim, 1997), even it breached intellectual property rights. Nevertheless, its industrialisation success was not just mere transformation involving just producing cheap and low-technology manufactured products, but was through deliberate and systematic evolution industrial policy with a gradual strong focus on producing and manufacturing higher-value-added and more

sophisticated products (Yülek, 2018). In 1960s and 1970s, its economic structure took a drastic transformation from agrarian to manufacturing and export-oriented.

The country registered rapid annual economic growth rates averaging 6.5%, 10.5%, 9.2% and 10.4% in periods (1960-1965), (1965-1970), (1970-1975) and (1975-1977) respectively (Vos, 1982, p. 95). However, in 1980 and 1998, the country endured subdued growth rates of -1.65% and -5%. 1998 growth rate was the worst in South Korea's history. Nevertheless, growth rate quickly recovered after both recessions, and these changes are the best in the country's history (9% in 1981 and 17% in 1999). As Figure 3.2 illustrates, MVA was approximately 11% in 1960. However, by 1970s and in 1988, it almost doubled and trebled respectively. In contrast, value added of agriculture, fishing and forestry during the first three years from 1960 sharply increased and in later years, it plummeted continuously.

Figure 3.2: South Korea's Agriculture and Manufacturing Composition, 1960-2019



Source: Author's computation of data from World Bank Database.

Furthermore, top exports constantly and rapidly tilted from lower-value-added and primary products towards higher-value-added and high-technology manufactured products. In 1960 products from the primary sector, particularly agriculture and mining dominated South Korea's top ten exports, but from 1970 it was dominated by light manufactured products (see Ahn (2013) and Yülek (2018, p. 166)). Between 1960s and 1970s, low-value manufactured and less sophisticated products constituted a lion's share of top ten exports. By 1980, products in light industry started to dominate exports basket, and by 1985, heavy and chemical products dominated. Since 1990, neither agricultural nor raw materials were among the top exports. South Korea's industrial upgrading and structural transformation over years is explicitly evident in Figure 3.2. The country gradually shifted from primary-based commodities such as agricultural and mining products to industrial-based manufactured products.

South Korea's transformation success to become industrialised is the shortest (19 years) in history (Ahn, 2013). Despite South Korea's population less than the world's 1% and 15 times smaller than USA's, it was the world's sixth and seventh largest exporter in 2019 and 2020. This rapid success and transformation have however left many with more questions than answers. Decades ago, South Korea was poor, but thanks to industrial policy and astute leadership it became an industrialised country. Changing production structure and export pattern did not happen accidentally or naturally, but through selective industrial policy that prioritised sectors and industries with high technology absorption and high economic linkages. It used technology upgrading as a means to penetrate international market and achieve international scale and competitiveness. South Korea's industrial policy took shape after Park Chung Hee's presidency. It started to develop home-grown industries and shifted from overdependence on imported technology to ISI to build local capabilities. Even when learning from others, it controlled ownership of domestic policies, but gradually developed domestic capabilities and managed risks through EOI.

South Korea's industrial policy was in two classes, with the first one comprised outward-oriented, bottom-up and integrated industrial policy while the second comprised inward-oriented, top-down and ad hoc industrial policy (Ahn, 2013). Under the first category, government discovered latent and potential comparative advantages then experimented and benchmarked them to international best practices, and applied performance-based rewards to reinforce and support

successful experiments and phase out unsuccessful ones. It systematically identified missing links in domestic value chains and implemented appropriate actions. Besides, it promoted domestic firms to do activities in higher value chain, took strategic risks and made concerted effort to improve firms' international competitiveness (Ahn, 2013, p. 6). Government also evaluated challenges on complimentary investments, scale economies and skills accumulation against underutilisation and financial distress.

Between 1962 and 1996, South Korea implemented seven Plans (see Table 3.5), which transformed her development and industrialisation narrative. Government designated certain industries to preferential access to subsidised credits, state investment loans and tax, but it had control over technology, prices and entry (Chang, 1993). It also provided R&D support to large industrial groups (*Chaebols*) to carry out research and innovative projects, but simultaneously shielded them from competition. However, continuation of protection and support was conditional to *Chaebols* meeting specified performance agreements. Performance-based rewards were achievable through corruption and rent seeking containment, continuous programme monitoring and choosing individuals with competency and meritocracy to lead programmes. No company was immune to state discipline for crossing the line, inefficiency and not accomplishing agreed targets. Government disciplined even politically and economically powerful companies owned by *Chaebols* and other individual conglomerates (Chang, 1993).

Table 3.5: South Korea's Development Plans Since 1960s

Plans	Basic Policy Direction	Priority industries and sectors
First Plan (1962-1966)	➤ The industrialisation process involved building self-reliant industrial structure and developing electric power critical for industrial production and expansion. ➤ Penetrating the export market. ➤ Building and developing import substitution industries.	➤ Electrical power. ➤ Cement production. ➤ Fertiliser production. ➤ Petroleum refining. ➤ Synthetic fibres.

Second Plan (1967-1971)	➤ Strengthening international competitiveness of products in the light industry. ➤ Shifting into heavy industry. ➤ Localising raw material supplies needed in production industries. ➤ Modernising industrial structure. ➤ Introducing and absorbing technologies.	➤ Chemicals. ➤ Machines. ➤ Steel.
Third Plan (1972-1976)	➤ Building an export-oriented industrial economy. ➤ Launching a US\$10 billion support for exporting industries. ➤ Targeting strategic and leading industries in the heavy and chemical industry. ➤ Developing local technologies and educating local workforce about technologies.	➤ Electronics. ➤ Iron and steel. ➤ Machinery. ➤ Non-ferrous metals. ➤ Petrochemicals. ➤ Shipbuilding. ➤ Transport equipment.
Fourth Plan (1977-1981)	➤ Promoting industrial growth and improving international competitiveness of exports. ➤ Expanding research facilities. ➤ Industrial rationalisation, particularly energy saving.	➤ Electronics. ➤ Iron and steel. ➤ Machines. ➤ Non-ferrous metals. ➤ Petrochemicals. ➤ Ships.
Fifth Plan (1982-1986)	➤ Promoting international competitiveness and class. ➤ Precision.	➤ Precision machinery. ➤ Electronics. ➤ Higher technology industry.

	➤ Developing and focusing on technology-intensity industries.	
Sixth Plan (1987-1991)	➤ Continuation of the previous plan. ➤ Developing higher technology. ➤ Promoting R&D. ➤ Training and nurturing human resource.	➤ Higher technology industries. ➤ Labour force. ➤ R&D.
Seventh Plan (1992-1996)	➤ Promoting research and investment in high-technology industries.	➤ High-technology fields such as: • Aerospace. • Bioengineering. • Fine chemicals. • Microelectronics.

Source: Ahn (2013, p. 29)

It is through implementing the above development plans that South Korea transformed herself to become a developed and industrialised economy and subsequently reduced poverty. Thanks to industrial policy, the country achieved high-income status and realised accelerated growth (Choi & Levchenko, 2021; Irwin, 2021; Kim et al., 2021). Today, South Korea is a global player in electronics, semiconductors, and shipbuilding, steel and textile products. Electronics particularly smartphones have been the pillars of South Korea's export earnings and economic growth (Lee & Mah, 2017). The country is also famous for manufacturing and exporting quality automobiles.

3.2.4.1 Automobile Industry

South Korea hardly had any automobiles in early 1950s and let alone a big automobile industry. However, government decided to change the narrative by cultivating the automobile industry to be an engine of South Korea's economic growth, thus accelerating economic development. Government targeted the automobile industry because it envisaged the industry to catalyse other manufacturing industries' development, both upstream and downstream which create significant industrial forward and backward linkages (Yülek et al., 2020). Government

offered various incentives and simultaneously imposed regulations to develop the industry during its development infancy stages. The industry at that time lacked technology restricting it only to assembling of components (Lee & Mah, 2017). In 1958, South Korea launched her first car, the American military jeep-style, which opened a new chapter in the industry (Statista, 2020a).

Subsequently, the “Big Three” automobile companies (Kia Motors, Shinjin Motors now Daewoo and Hyundai Motors - the companies’ profile is Green (1992)) entered the industry after their establishments in 1962, 1966 and 1967 respectively. Although big private players dominated the industry, between 1960s and early 1980s, government intervened extensively to stir development of automobile industry and economic development through industrial policy and other policies, (Mason et al., 1980).

Government enforced a law to protect automobile under the first plan. The law prohibited importation of knocked-down and complete vehicles up to end of 1967 and it provided tax exemptions on parts and components and import tariffs exemptions to assemblers (Chung & Kim, 2014, p. 3; Green, 1992, pp. 413-414). The law also promoted big players’ participation in the industry, but simultaneously prevented overcrowding of small ones (Chung & Kim, 2014). In 1974, government availed a “Long-Term Automobile Production Plan³⁵”. The plan aimed at encouraging heavy and chemical industries and domestic auto industry development through financial support, import substitution and gradual local content rise (Green, 1992; Lee & Mah, 2017).

Government made it mandatory for all automakers to establish factories that could produce essential vehicle components and parts. Domestic models assemblers had to meet five mandatory conditions consistent with first plan requirements (Yülek et al., 2020, p. 321). Firstly, assemblers had to develop fuel-efficient and small-sized cars with an engine capacity of less than 1500cc. Secondly, to increase demand and competitiveness of domestic cars against foreign ones, domestic car prices were not to exceed US\$2, 000. Thirdly, local cars’ LCR threshold had to gradually rise above 95%, thus with time, assemblers had to produce vehicle key components and parts locally or establish facilities locally. Fourthly, annual vehicle production had to exceed 50, 000 units per car model. Fifthly, assemblers of local car brands had to meet the above conditions

³⁵ See Lee and Mah (2017, p. 231) for a detailed list of the targets and basic principles of the plan.

within two and a half years. Those who met the conditions received lucrative incentives including monopoly to produce people's car and more than 80% market share guarantee from government.

Government restricted imports and increased tariff rates on passenger vehicles from 150 to 250%, as efforts to stimulate domestic vehicle demand. It passed a law that allows assemblers of domestic car brands to assemble one unit of foreign car brand if they export five units of local car brands, and allowed them to set higher prices in the domestic market than the foreign market for same vehicle makes (Yülek et al., 2020). The incentives promoted Hyundai which partnered Ford, to produce its first model (Cortina) in 1968. However, after splitting with Ford in 1975, Hyundai made a breakthrough to produce its first Pony car, consequently South Korea became the sixteenth global and second Asia country to produce its own vehicle model (Chung & Kim, 2014, p. 4).

Other domestic companies later joined the industry, and they strengthened technical capacity by entering into technical cooperation with foreign owned companies. With time, government prohibited foreign companies to venture into automobile industry without domestic companies' partnership. It also required local companies aspiring to establish car factories to have capital in excess of US\$7 million plus a contract with foreign firms obliged to license transfer of technology (Lee & Mah, 2017, p. 234). These policies aimed at promoting technological learning and developing local capabilities by domestic automakers from foreign automakers of advanced countries. In 1976, South Korea's first automobiles export consignment was to Ecuador, which imported six cars using bananas (Green, 1992, p. 414). One car today could probably import more or the same value of bananas it imported in 1976. The industry was not competitive and lucrative resulting in considerable output fluctuations owing to oil crises in 1970s and 1980s, and political turmoil subsequent to president, Park Chung Hee in 1979's death in 1979 (Chung & Kim, 2014; Green, 1992).

Nevertheless, due to rapid growth and industrial transformation in 1970s heavy industry accounted 40% and 56% of manufacturing sector in 1971 and 1980 respectively (Amsden, 1989, p. 152). Also, the government that succeeded Park Chung Hee prevented business overlapping, encouraged specialisation and minimised competition in the automobile industry (Chung & Kim, 2014). In 1981, government introduced a rationalisation scheme, which minimised overlapping

investments in heavy and chemical industry, but targeted six strategic industries namely; electronics, machinery, non-steel metals, petro-chemicals, shipbuilding and steel, and automobile industry (Kim, 1997; Lee & Mah, 2017).

In 1998 and 1999, South Korea's motor vehicle production was greater than that of South America combined, that is, 1, 958, 000 and 2, 843, 000 versus 1, 893, 000 and 1, 651, 000 units respectively (OICA, 1999). By 2001, South Korea's automobile industry had established and became the world's fifth largest auto manufacturer, accounting 10% of global automobile output. In 2019, it surpassed USA in producing passenger cars to become the fifth global producer behind India, Germany, Japan and China (Statista, 2020a, 2021). Its passenger car output accounted 13% of its manufacturing output. Between 2016 and 2019, and between 2018 and 2019, India and Mexico both surpassed South Korea for respective fifth and sixth largest global auto producers. However, South Korea regained the fifth position in 2020. Leapfrogging back to this position within a short period materialised thanks to technological catching up and localisation.

However, the success involved extensive state intervention. Government built educational institutions, improved human capital resources and established research institutes aimed at advancing domestic industrial and innovation and technological capabilities in automobile industry, heavy and chemical industries, etc. (Lee & Mah, 2017). As automobile and industries in heavy and chemical industry grew, demand for research institutes and skilled workforce, particularly engineers, scientists and other professionals in the science and technology fields considerably rose.

Government used fiscal incentives and generous tax concessions to control and direct investments into preferred sectors and industries for instance sectors with export potential and heavy and chemical industries. Besides government support, auto producers had entrepreneurship mind-set, strong determination and zeal to learn and leverage technological independence from competitors and become global automobile players (Ritter, 2010, p. 70). South Korea's automobile industry managed to catch up with that of advanced countries thanks to heavy government support to the industry. Above all, leadership of auto producers, particularly Hyundai, had strong determination and vision to penetrate the automobile global export market and make enormous improvements in quality and R&D activities. Furthermore, auto producers gained market access

against competitors thanks to low production costs, high incentives for R&D, low innovation frequency and technological trajectory predictability of the industry (Lee & Lim, 2001, p. 478).

Effective industrial policy stimulated automobile companies to develop domestic car models and helped them to move towards greater competence at global level. Generally, the country's success story in the industry provides important policy implications for other LDCs aspiring to manufacture automobile. Other LDCs can also follow the path South Korea ensued in developing her automobile industry. However, automobile industry success requires government to build necessary enabling infrastructure and regulate economic activities through carrots-and-sticks which promoted technological improvements and collaborations of domestic and foreign automakers (Lee & Mah, 2017).

Government's intervention in the automobile industry was key in transitioning South Korean economy from low-income to high-income level within a short period. However, this successful was not without its challenges at some point. For example, in mid-1960s through government license, Saenara established an assembly plant. Government also made other commitments like providing financial support and protection, but the company failed to meet government's expectations and ceased operations prematurely (Yülek et al., 2020).

South Korea's remarkable achievements in automobile industry have caused analysts, policymakers and development practitioners to ask more questions than answers. Its rise to stardom in global automobile market within a short period set tongues wagging and aroused several questions regarding its ability to penetrate lucrative markets and also command significant influence in an industry considered mature and characterised with high competition and high technology intensity. The most inevitable questions arise are how the country managed to establish its domestic vehicles and get a foothold in global auto production and export market, and what strategies and policies did the country pursue to catch up and compete with advanced countries' industries, given that automobile industry is generally a mature and highly competitive industry. Today, the country stands out as a role model of success for many LDCs. Also, many scholars in development economics attribute South Korea's economic development and success to state-led industrialisation.

3.2.5 Taiwan

Taiwan is among emerging Asian latecomer industrialising economies, which like South Korea reduced the gap between her per capita income and that of advanced economies within a short period. Efforts to industrialise started around 1950. Secondary industry excluding mining and, primary industry including mining accounted around 15% and 58% aggregate employment respectively in 1952 respectively (Chen, 1996, p. 140). However, by 1987 the situation had changed remarkably with the two sectors accounted 42.3% and 5.7% (ibid).

Thanks to intact state apparatus epitomised by stable and strong top brass political leadership, blameless and competent policymakers, and loyal and skilful public servants, Taiwan successfully industrialised and transformed economically (Pang, 1992). Besides supporting comparative advantage labour-intensive activities in 1950s, government propelled industrial deepening by supporting capital-intensive industries despite having comparative disadvantage in that area (ibid). Government deliberately picked winners to enhance technology in textile, apparel and chemical industries (Chen, 1996). It also created comparative advantages from completely different and new industries as opposed to sticking to comparative advantages in existing industries or sectors. Government deliberately got prices wrong and used non-price policies to lead private sector into investing in heavy and chemical industries (Wade, 1990, p. 299).

Government constantly and intentionally made delays to firms wanting to import certain raw materials as an indirect way to force them to source them locally (Wade, 2009). Taiwan's Industrial Development Bureau officials could sometimes make arrangements to protect new firms that would want to embark on domestic import substitution, but for a certain period and on condition that price of their goods would fall and their quality would rise to match that of international standards (ibid). Government enacted a law that governs establishment and operations of EPZs. It exempted commodity taxes, levies, customs duties and sales taxes on firms that were operating in these zones, but only those that could create considerable job opportunities could operate (Pang, 1992). The strategies paid dividends and enabled Taiwanese economy to shift towards high technology sectors.

Today, Taiwan is home to high-technology industries. Since 1980s, these industries are the lifeblood of its economy (Wang & Chiu, 2014). Electronics industry has been among key

manufacturing sector industries, and has always been the largest contributor to manufacturing sector's export earnings. In the 1980s and 1990s, electronics industry accounted for around 10% of manufacturing sector's export earnings. However, from 2006 the industry's contribution more than doubled. Between 1951 and 1962, manufacturing sector accounted only less than 20% of total Taiwanese GDP. Nevertheless, after intensifying its efforts to industrialise, manufacturing sector became the mainstay of economy representing an annual share averaging approximately 30% from 1970 to 2020³⁶. Semiconductor industry was undoubtedly key in that regard, so analysing government policy in this industry is pertinent.

3.2.5.1 Semiconductor Industry

Many East Asian economies succeeded in developing their manufacturing sector. They made a global footprint in electronics industry and significant export volumes of computers, computer chips, semiconductors, smartphones and television sets. Semiconductor industry is important for other industries' development, particularly computers, smartphones and automobiles. Taiwan established her name in this industry. Semiconductor products comprise discrete devices, integrated circuits and optoelectronics, with integrated circuits accounting a lion's share of semiconductors (Tung, 2001). Semiconductors are a very useful source of power to many electronic devices. The industry is an important upstream industry for automobiles, computers, smartphones, television sets, etc. It is key for most emerging technology industries such as artificial intelligence, internet of things, automobile and electronics. Increasing digitalisation in automobile industry makes semiconductors indispensably key for every modern car because they are used to monitor tyre pressure, control air conditioning systems and ensure proper functioning of airbags in the event an accident occur. Automobile industry's share of total sales of semiconductors³⁷ rose by 65% from US\$25.4 billion in 2012 to US\$41.8 billion in 2018. However, the shares of revenue

³⁶ <https://eng.stat.gov.tw/ct.asp?xItem=37408&CtNode=5347&mp=5>

³⁷ https://www.statista.com/chart/24504/revenue-of-global-automotive-semiconductor-production/?utm_source=Statista+Newsletters&utm_campaign=2f55cc679e-All_InfographTicker_daily_COM_AM_KW22_2021_We&utm_medium=email&utm_term=0_662f7ed75e-2f55cc679e-314911325

in 2019 and 2020 fell below that of 2018. The industry contributed to other industries' rapid growth and transformation, particularly high-technology in Taiwan and other countries.

Taiwan's semiconductor production started with General Instrument Microelectronics in 1966, but industrial scale production began in 1973 after establishment of Industrial Technology Research Institute (Chang & Hsu, 1998; Rasiah et al., 2016). In 1978, Taiwan established a state-of-the-art high-technology infrastructure, but the facility officially opened in 1980. The technology infrastructure (Hsinchu Industrial Park) to develop electronics and semiconductors industries was a concept similar to USA's Silicon Valley.

Semiconductor industry comprises four production stages namely; design (less capital-intensive, but knowledge-intensive), fabrication (capital- and technology-intensive), packaging (labour- and technology-intensive) and testing (predominantly capital-intensive) (Tung, 2001, p. 268). In 2019, the industry's global market size was over US\$400 billion, and in 2021, it was around US\$460 billion.

At most, 39 and 34 countries are respectively involved in semiconductor's direct value chain and value chain of supporting functions. USA's value added to global supply chain of semiconductors is the largest (39%) while South Korea, Japan and Taiwan's are 16%, 14% and 12% respective (Khan et al., 2021). USA, Japan and South Korea dominated the industry in 1980s, while Taiwan's was insignificant during that period. However, from late 1990s Taiwan produced semiconductors worth billions of dollars making it the world's fourth largest semiconductor-producing nation ahead of industrial giants in Europe. The industry is among important contributors to Taiwan's economic growth and export earnings, representing over 30% of total exports (Ting-Fang & Li, 2021). Globally, Taiwan has the largest foundry (semiconductor contract manufacturing) and integrated circuit wafer fabrication capacity.

In 2018, Taiwan's semiconductor industry R&D expenditure ranked third after USA and South Korea corresponding to 6.8, 38.7 and 8.4 billion dollars (Khan et al., 2021). Furthermore, Taiwan's R&D intensity in 2019 was second behind USA, each constituting over 10 and 15% respectively. Taiwan's tremendous achievements in the industry was through government's effective implementation of policies. Government assisted firms in the industry to build domestic innovation capabilities and move towards higher technology frontier (Rasiah et al., 2016).

Government established EPZs and R&D institutes for purposes of attracting FDI and helping technological upgrading in the industry (Chen & Jan, 2005). However, little investment went to front-end processes and more in low-end processes of the industry. Government further established a research institute to spearhead projects that focused on developing electronics industry. Both the research institute and government intervention stimulated learning and innovation as well as enabled firms in semiconductor industry to upgrade towards front-end production processes (Amsden & Chu, 2003). Since the front-end of semiconductor industry has high risk and requires high investment and technology, governments support to develop this industry is inevitable. During its (semiconductor industry) early stages of development, government made significant expenditures on R&D activities, financed the public sector, invested in science-based industrial parks, increased tax incentives and developed necessary human capital (Tung, 2001).

Government also offered various incentives including tax benefits and grants for R&D and upgrading technology, and investment allowances, low interest rates on loans and tariff exemptions to encourage participation of local firms and increase local technological capabilities (Rasiah et al., 2016). By 1980s, many companies had invested in the industry. Today, Taiwan's Semiconductor Manufacturing Company is competing with other global giants like Intel, Qualcomm, Samsung, etc. and is among leading global semiconductors producers. The company stimulated and shaped the competitiveness, development and overall production structure of Taiwanese semiconductor industry.

Analysts had anticipated the COVID-19 pandemic to spark a global semiconductors and chips shortage to disrupt the automobile industry and other industries using semiconductors. Nevertheless, the industry's production increased by 3% by indirectly benefiting from lockdowns and regulations imposed to curb the spread of COVID-19 and increased demand. These lockdowns actually increased the demand for working and studying from home, e-learning, virtual and online conferences thereby increasing the demand for semiconductors and ultimately the industry's revenue, which soared by 7.3% in 2020 compared to a 12% decline in 2019 (Gartner, 2021). Semiconductor industry's growth despite COVID-19 saw Taiwan's economic growth rising by 2.98% in 2020 outperforming that of China (2.3%) first ever since 1990. However, the 2021 drought that affected Taiwan is the worst in history in over 50 years reduced water supplies, and

ultimately negatively affected semiconductors production. COVID-19 and acute water supplies in Taiwan reduced the production of semiconductors and this affected the global automobile industry, particularly European and American automobile industries.

3.2.6 Thailand

After Indonesia, Thailand is the second biggest Southeast Asian economy. Thais of Chinese provenance through their expertise in business and connections with Chinese investors were critical to Thailand's economic development (Fuangkajonsak, 2006). The country also experienced political drastic changes in 1932 leading to state co-opting Chinese Thais in economic activities. Between 1958 and 1988, Sarit and Prem administrations strategically used official development assistance to foster "dual track" development policy, a home grown strategy aimed at promoting exports and stabilising society (Jerve & Nissanke, 2008, p. 18).

Thailand's economy began to take shape in 1980s. Massive structural transformation took effect between 1980s and 1990s. For example, agriculture used to supply over 70% to total employment in 1980, nevertheless its share of GDP dropped by almost 50 percentage points to 11% in 1994 from 21% in 1980 (Phongpaichit, 1996). Alternatively, manufacturing sector's share increased to 29% from 22% while exports of manufactured products' share of total exports rapidly rose to 81% from 36%. Furthermore, the annual growth of manufactured products exports averaged 30% since 1986, and was the main driver of Thailand's economic growth and transformation (Phongpaichit, 1996, p. 370).

Thailand's industrial policy began in 1960 as part of ISI for all industries, but the policy was widely horizontal orientation in nature. Numerous government incentives comprising corporate tax exemptions, deregulation of land ownership, work permission for foreign technical experts, tariff exemptions and reductions on imported machinery and intermediate goods and tax reduction on experts constituted ISI strategy (Doner, 1991; Natsuda & Thoburn, 2013). Thailand's development plan appears less of a developmental state, however, government does not leave industrial development to free market (Phongpaichit, 1996). Thailand's industrial development involved the state spearheading the process and building industrial bases through collaboration with foreign corporations and local private sector (Tai & Ku, 2013).

Thailand is currently Southeast's automobile production and sales hub, and the region's leader in tourism and electronics industries. The automobile industry is the mainstay of Thailand's economy contributing over 10% and 6% to GDP and total employment respectively. Nevertheless, electrical and electronics industry remains Thailand's largest export sector, contributing around 15% to overall exports. This section analyses industrial policy in Thailand's automobile industry.

3.2.6.1 Automobile Industry

Thailand's automobile industry evolved from auto component assembler to become automobile production leader and export centre in Southeast Asia over the past five decades. Surprisingly, Thailand's total automobile exports valued below US\$500, 000 in 1995 and did not even match India and Malaysia's. Nevertheless, by 2008, Thailand's automobile exports valued nearly US\$28 billion (Hosono, 2015, p. 59). With automobile products bound for over 100 export destinations, Thailand's automobile industry produces the largest commercial vehicles and exports the largest number of automobile parts in Southeast Asia and holds the world's sixth and 13th positions in these areas. The country once envisioned the automobile industry to be "the Detroit of Asia". This is a reality as Thailand is now a stronghold in automobile industry as substantiated by statistics. Its automobile industry derives success from its ability to adapt policies to changing global industrial parameters and long-term government support. Major Japanese original equipment manufacturers (OEM) namely, Toyota, Isuzu and Honda, dominate Thailand's industry.

Four stages of industrial policy explain Thailand's automobile industry development (Tai & Ku, 2013):

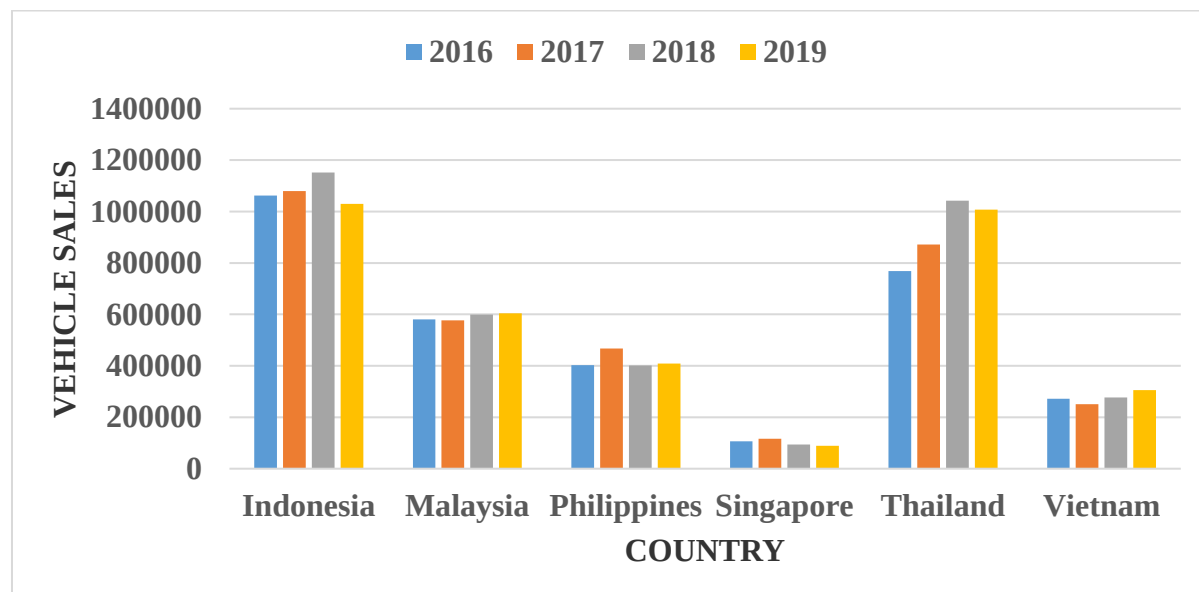
- Establishment phase (1961-1970) - focused on creating production capacity,
- Regulated period (1971-1989) - focused on strengthening production and promoting localisation,
- Export-oriented phase (1990-2000) – focused on driving exports and
- Liberalisation period (2000 onwards) – focused on embracing liberalisation and free trade.

During the establishment phase, local investors lacked expertise and good management; therefore, they cooperated and formed joint ventures with foreign investors. Government placed

80% and 60% import duty on vehicles and motorcycles respectively for over three decades. This encouraged foreign manufacturers to establish production bases locally and reduce importation of components. Government further adopted “dependent development” strategy, which co-opted international auto manufacturers and provided them with incentives to enhance Thailand’s automotive industry properly fit in the family of global automotive supply chain (Tai & Ku, 2013). Thailand’s industrial policy was oriented towards promoting FDI to enable local automobile investors acquire technology and experience (Haraguchi, 2002).

From 2018 to 2019, Thailand produced over two million units, making it the world’s 11th largest producer of automobile and first in Southeast Asia ahead of Indonesia on second spot followed by Malaysia, Vietnam and Philippines (Natsuda & Thoburn, 2021; Natsuda et al., 2020). However, Indonesia had the largest with over one million units annually from 2016 to 2019 followed by Thailand, Malaysia, Philippines, Vietnam and Singapore (see Figure 3.3) (Just Auto, 2020). Nevertheless, Thailand’s sales significantly increased while Singapore saw a decline. In 2018 and 2019, Southeast Asia’s vehicle sales declined by 3.3% with Indonesia the most heavily affected (10.5%) followed by Singapore (5%) and Thailand (3.3%) (Just Auto, 2020). However, the winners were Vietnam (10.6%), Philippines (1.8%) and Malaysia (0.9%) (ibid). The COVID-19 pandemic worsened the region and selected individual economies’ automobile sales in 2020.

Figure 3.3: Number of Vehicles Sales in Selected Southeast Asia, 2016-2019



Source: Just Auto (2020)

WTO agreements affect motor industry development in LDCs (Natsuda & Thoburn, 2014). TRIMs prohibit use of any performance requirements, for example, foreign currency balancing and LCRs. WTO discourages use of SCMs such as actionable and export subsidies, and local content because they distort international trade and disadvantage other member states. Actionable subsidies are not completely unlawful, but WTO may deem them inappropriate if they cause economic injury or harm. Nevertheless, WTO regulations do not completely close policy spaces for member countries³⁸ to develop their automotive industry (Natsuda & Thoburn, 2014). Although they remain very limited, countries can pursue other policy options and avenues.

Government announced its first sector-specific (automobile) industrial policy focused on boosting motor industry's economies of scale and reducing trade deficits arose from importing completely knocked down kits (Natsuda et al., 2020, p. 7). Government predominantly and systematically used selective industrial policies and FDI to promote export industries' development (Rock, 2001). Government also controlled number of vehicle models, raised LCRs³⁹ to stimulate domestic production of parts and introduced a mandatory deletion programme in 1978 to remove certain motor components from the list of imported completely knocked down kits (Natsuda et al., 2020). Even in 1980s and 1990s, government used LCRs to facilitate backward linkages for local manufacturers of components and mitigate balance of payment problem (Natsuda & Thoburn, 2013). LCRs forced assemblers to either produce locally or buy parts and components from domestic suppliers. However, there were few supporting domestic industries and components suppliers, thus forced government to relax for a while, conditions for implementing LCRs. Government later revised or altered its LCR policy stance and allowed only local production of certain important motor components like engines. Government envisaged that LCR beyond a 54% threshold could compromise vehicle safety and increase production costs (Techakanont, 2008, p. 8). LCR greatly influenced automobile industry development as it facilitates accumulation of knowledge and training of skilled workforce such as engineers and technicians (Yamashita, 2004).

³⁸ Malaysia and Thailand carved out their ways to develop their motor industry using the limited available policy space.

³⁹ It took effect in 1973, though introduced in 1971.

What is more, government facilitated industrial estates and clustering development of firms in automobile industry dotted around major cities. To expedite foreign investment flow in automobile industry, government provided good infrastructure (road, rail, ports and other logistic facilities) and tax incentives (Lecler, 2002, p. 802). These saw automobile production rising to around 2.5 million units in 2012 from around 500, 000 in 1996 (Natsuda et al., 2020, p. 8).

To avoid conflicting with new WTO rules introduced since 2000, government considerably revised its industrial policy and introduced motor sector-specific policy measures. Various Automotive Master Plans (AMP) namely; first AMP (2002-2006), second AMP (2007-2011), third AMP (2012-2016) and finally Electric Vehicle Action Plan (2016-2036) were introduced (Natsuda et al., 2020, p. 7). The country projected to manufacture 1.2 million units of electric vehicles and 690 charging stands by 2036 (Natsuda et al., 2020).

Government selected pick-up trucks as the first product champion due to their strong domestic demand, and subsequently picked eco-cars and electric vehicles as product champions (Natsuda & Thoburn, 2021). For first product champion, government offered tax benefits to assemblers and suppliers, but conditional on assemblers approved investment projects of suppliers. Government mandated assemblers to localise four parts from every five main engine parts as part of conditions to access tax incentives (Natsuda et al., 2020). For second champion, government reduced corporate tax and excise tax on eco-cars provided recipients of these incentives localise and adopt specific technologies and local production criteria (Natsuda et al., 2020, p. 8).

Government also provided numerous incentives for purposes of R&D advancement. To stimulate local demand, it further reduced excise tax rates substantially (Natsuda & Thoburn, 2013) and offered discounted prices to first time vehicle buyers, and to stimulate supply, offered suppliers with numerous tax exemptions (Attavanich, 2017). Supply-side exemptions attracted substantial FDI, and since early 2000s, Thailand is an exporting and production hub for leading Japanese pick-up truck manufacturers like Isuzu and Toyota (Natsuda & Thoburn, 2013). Strong institutions and lack of interference by political leaders and senior policymakers in the decision-making process necessitated growth of the automobile industry (Athukorala & Kohpaiboon, 2010, p. 12). Thai Automotive Institute, a government agency, was pivotal in reinforcing linkages, both backward and forward, among local and foreign firms, and research institutions (Intarakumnerd & Gerd Sri,

2014). These led to significant R&D and technical fields improvements because local firms learned from leading foreign firms. However, indigenous assemblers and suppliers failed to upgrade their technologies. Also, stiff competition from foreign assemblers and suppliers is pushing down indigenous assemblers and suppliers from high value chain (Tier 1 – supplies components directly to OEM⁴⁰) to lower value chain (Tier 2 – supplies components to Tier 1 not directly to OEM). However, developing automobile industry requires skilled labour, knowledge accumulation, capabilities development and supporting industries that supply components and parts (Athukorala & Kohpaiboon, 2010; Hosono, 2015).

3.2.7 UAE

UAE is a federation since 1971, which comprises seven separate Emirates or sheikhdoms namely; Abu Dhabi (capital city and largest in land size), Ajman (smallest), Dubai, Fujairah, Umm Al Quwain, Sharjah and Ras Al Khaimah. UAE's economic structure overview reveals that fishing, pearling and trading were once main economic activities till discovery of substantial oil volumes in Abu Dhabi (1958) and Dubai (1966) (Al Abed et al., 2006; Ghanem, 2001). For several decades, oil and gas are the economy's backbone contributing almost 40% to GDP and over 50% to export revenues.

Oil reserves in Dubai depleted in 1970s awakened UAE to understand that oil reserves in other Emirates would one day dry, thus it embarked on income sources diversification and oil overdependence reduction (Guéraiche, 2018). UAE also embarked on massive industrial base developments and industry-related infrastructure investments using oil wealth proceeds to correct economic structure and ensure sustainable economic development. It made significant headways towards lessening oil and gas revenue dependence, hence intensified high-technology manufacturing industries and economic activities diversification breakthroughs. Government also supported investment, creation and development of manufacturing industries such as cement, fertiliser and oil refining industries that are linked to oil and gas extraction (Ghanem, 2001). These helped to maintain economic growth and economic stabilisation and prevented economy from oil price shocks and production fluctuations (Al Abed et al., 2006). Development Strategy (2011-2013) and Vision 2021 were also part of government's efforts to stimulate economic

⁴⁰ They make the final product and sell directly to the consumer.

diversification and industrialisation (Hvidt, 2013). Non-oil sectors increased GDP contribution signifying that the efforts to diversify economic activities were paying off.

Government established specialised free zone areas in Abu Dhabi, Dubai and other Emirates to facilitate investment of key industries. These industrial zones are key development strategies to drive on economic diversification and industrialisation and promote FDI. Diversification programmes targeted key sectors by offering zero personal tax, corporate tax holidays and 100% ownership to international companies that chose to establish businesses in free trade zones. Industrial policy implementation was also decentralised to each Emirate.

Government also established a department in each Emirate to support industrial activities and industrial development, exempt enterprises in industrial sector from paying customs duties on capital goods and export duties, and facilitate modification, simplification and standardisation of investment procedures and licence approvals for enterprises intending to invest in industrial sector (Seric & Tong, 2019). Furthermore, UAE's two richest Emirates, Abu Dhabi and Dubai, have a separate vision and development strategy but tied to national strategy and vision.

Federal governments also established a development bank (Emirates Industrial Bank) in 1982, which financed and promoted industrial development. However, only firms with local ownership amounting at least 51% and investments in capital-intensive and technologically advanced projects and those who use local raw materials and produce import-substitution goods got funding. UAE also built a deep water port facility in Dubai to improve trading and logistic environment (Chang et al., 2016). The city is geographically and strategically positioned and is main trading route between Asia and Europe. Dubai created the first free zone, Jebel-Ali in 1985. The zone attracted many foreign enterprises, and is home to international large-scale exporting, logistics and shipping companies. Companies in the zone got incentives such as exemptions from abiding by certain labour laws and paying corporate tax and customs duties, and repatriation of any amount of funds (Shayah, 2015). With these incentives, companies establishing shops in Jebel-Ali free zone rose considerably from just 19 in 1985 to over 500 in 1995, more than 6, 400 in 2010 and over 7, 500 in 2020⁴¹. UAE's industrial sector accounted for 46.2% of GDP and 34% of the country's total workforce. In 2021, UAE launched 'Operation 300 billion (2021-2036)', an

⁴¹<https://gulfnews.com/uae/jebel-ali-free-zone-everything-you-need-to-know-about-jafza-1.1577097555736>

industrial strategy aimed at boosting UAE's image as a favourable future global investment destination, creating attractive environment for business and investment, stimulating adoption of advanced technology and innovation and supporting development of home-grown competitive industries.

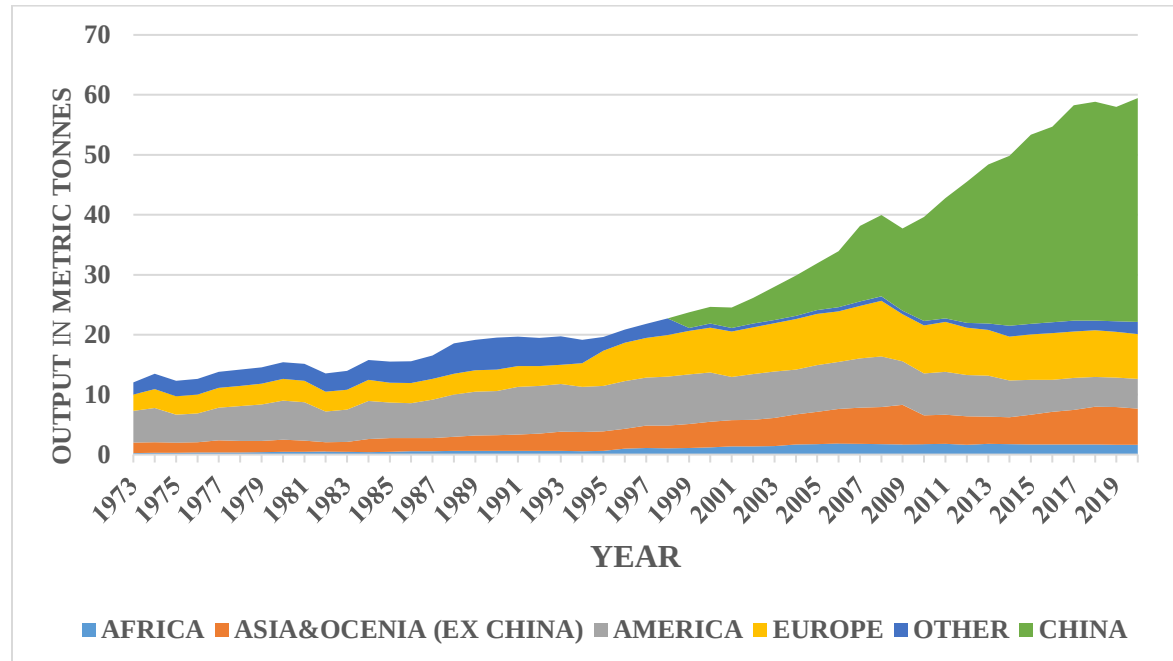
3.2.7.1 Aluminium Industry

Among most abundant element and prevalent metal in Earth's crust is aluminium, trailing behind oxygen and silicon (Mishra, 2020; Sajwani, 2017). It is the earth's second most widely used metal on after steel. It possesses distinctive features and advantages such as electrical conductivity, durability, lightweight, strength, recyclability, workability, non-permeability and resistant to corrosion that other metals do not (Menzie et al., 2010; Mishra, 2020; Saraswat & Ghosh, 2018). Henceforth, it is widely used practically in various fields including construction and building projects, electricity transmission and air conditioning, heat exchange, refrigeration and transportation systems. Construction and transport industries use largest aluminium quantities individually accounting for almost 30% of world's aluminium consumption. Primary aluminium production requires more capital and energy; hence, involving only large players. The notable global players include; Alcoa (American), Chalco, Hongqiao, Shandong and Xinfu (Chinese), Rio Tinto Alcan (Australian), Rusal (Russia) and Emirates Global Aluminium (UAE owned). Several factors like high transportation and production costs, government policies, high capital expenditures, economies of scale and upstream vertical integration affect aluminium industry's competitiveness (United States International Trade Commission [USITC], 2017, p. 103).

As Figure 3.4 shows, primary aluminium production by China expanded rapidly since late 1990s. Geographical distribution and location surrounding primary aluminium consumption and production dramatically shifted from west to east since 1972. USA and China accounted for about 32% and 36% and less than 2.5% and 3% of globe's primary aluminium consumption and production in 1972 respectively. However since 2010, China commands primary aluminium production and consumption, and in 2010 accounted 40% and 39% globally while USA had only 11% and 4% respectively (Nappi, 2013). Since 2013, China's global primary aluminium production grew more than other countries' combined output. Over the years, China experienced

unprecedented aluminium growth, and registered the highest significant increase in both primary aluminium consumption and production.

Figure 3.4: Primary Aluminium Production by Regions, 1973-2020



Source: Author compilation of data from the International Aluminium Institute⁴²

Aluminium industry has high market potential, technology intensity and high value addition, and creates high linkage effects with many sectors. For example, automobile, aviation, construction, defence, electricity, machinery and packaging industries use output from aluminium industry (forward linkages) while chemical, mining, machinery and power industries or sectors supply inputs to the industry (backward linkages). Aluminium industry generates greater than one forward and backward multiplier effects (Sarawat & Ghosh, 2018, p. 9). Henceforth, many countries consider aluminium industry a strategic economic sector, and they endeavour to include it in industrial development plans (ibid).

Aluminium industry is key to UAE's economy, hence is among important industries in the country's 2030 industrial development strategy. Gulf Cooperation Council (GCC) member countries earn most of their revenues from oil and gas. They lately embraced diversification to

⁴² <https://www.world-aluminium.org/statistics/#data>

other viable industries to reduce overdependence on oil and gas revenue. Today, GCC countries are diversifying beyond just producing hydrocarbons to producing value-added aluminium products. The GCC⁴³ countries excluding Kuwait, contributed fifth of world's primary aluminium production in 2016 (Perez, 2016, p. 25). Nonetheless, UAE accounts for nearly 50% of GCC's primary aluminium production. Between 2011 and 2015, UAE's aluminium exports amounted over 50% of GCC's exports of unwrought aluminium (USITC, 2017, p. 318). Moreover, UAE surpassed India to become global fourth largest primary aluminium producer. However, India reclaimed the position in 2016, but, in 2017 and since 2018 it stood at third and second positions respectively surpassing Canada and Russia. Moreover, since 2016 UAE is world's number five producer of primary aluminium contributing close to 4% annual average. GCC countries enjoy competitive advantage in aluminium due to generous government support, large gas reserves and low cost supplies of natural gas to produce electricity energy, which is intensively used in aluminium production (USITC, 2017, p. 303). They made great strides in technology upgrading and investments in aluminium industry-related downstream and upstream industries, thus significantly lowering production costs. Most GCC countries implemented energy policies to effectively reduce electricity and natural gas costs and promote energy-intensity aluminium production. Consequently, the region's aluminium production and exports increased by around 22% and 30% respectively (USITC, 2017, p. 430). Furthermore, they reduced corporate taxes and cut down energy, electricity and labour costs for aluminium producing companies.

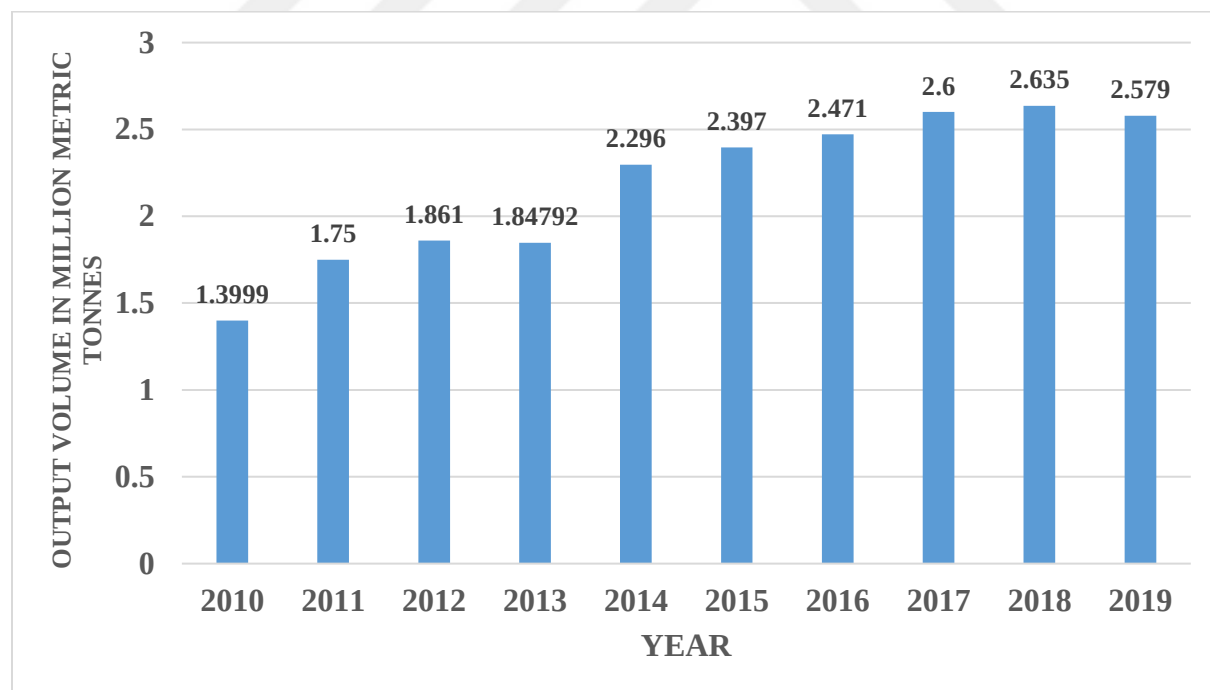
UAE established aluminium industry to strengthen economic growth, diversify and reduce overdependence on oil and gas proceeds and reduce external price fluctuations and other economic shocks. In 1975, it created a state-owned enterprise (Dubal), which specialises in aluminium smelting, but actual aluminium production only started in 1979 (Perez, 2016). Emirates Global Aluminium (EGA) was formed in 2013 as a joint venture between Dubal and Emirates Aluminium. EGA is a 50-50% joint public partnership between Abu Dhabi's Mubadala Development Corporation and Dubai's Investment Corporation (USITC, 2017, p. 305). EGA is the largest manufacturing entity and UAE's biggest economy contributor outside non-oil sector and Middle East's largest primary aluminium producer. It was global top premium aluminium producer in 2019 and 2020, commanding 4% of global aluminium output. One of EGA's plants is

⁴³ Bahrain, Oman, Qatar, UAE and Saudi Arabia

located close to Dugas plant and Jebel-Ali port, making it more convenient to access electricity supply and raw materials for smelting operations and export smelted aluminium (Al Abed et al., 2006). In 2013, EGA entered a joint venture with Guinea Alumina Corporation to secure uninterrupted supplies of bauxite rock that contains aluminium ore, and is a key raw material for aluminium production (Perez, 2016).

AUE's industrial policy strategy not only enabled Dubal and later EGA to increase aluminium production but also facilitated substantial resource investments exclusive for technology upgrading. Explicitly, developments of DX and DX⁺ technologies enhanced Dubal's ability, capability and efficiency to produce world's highest standard and purest aluminium. In 2017, aluminium industry supported 60,950 jobs in total (direct, indirect and induced jobs) across UAE, and one new job in aluminium industry induced an additional five jobs throughout the economy (Godden, 2018).

Figure 3.5: UAE's Annual Aluminium Production, 2010-2019



Source: Statista (2020d)

Between 2010 and 2019, UAE's aluminium production generally increased (see Figure 3.5). However, in 2013 and 2019 production slowed down. Diversifying to aluminium production not only induced development, but also triggered UAE to foster sustainable resource-led

industrialisation and develop productive capabilities in aluminium-related industries. The efforts paid dividends because UAE invested massively in sophisticated physical infrastructure and provided generous support to firms investing in energy production.

3.2.8 Vietnam

Historically, Vietnam is renowned for the ravaging war between North and South Vietnam from 1955 to 1975, in which USA and some other anti-communist forces backed the South killing between 800, 000 and 3.1 million people (Chang et al., 2016, p. 92). North Vietnam subdued in that war leading to merging of the two into Socialist Republic of Vietnam. The new Socialist government embarked on a mass collectivization of farms, factories and industries. Between 1961 and 1985, Vietnam implemented three Five-Year Plans (1961-1965⁴⁴, 1976-1980 and 1981-1985). However, a new group of young politicians emerged in 1986 to replace the old guard or political godfathers. These introduced raft political and economic reforms popularly called ‘Doi Moi’, which facilitated Vietnam’s economic transition from command to socialist market-driven economy. This was the genesis of Vietnam’s exceptional economic growth and structural change.

Government began to appreciate industrial policy’s importance in expanding and diversifying manufacturing production base. Between 1986 and 2006, its industrial policy followed a centrally planned system, and the focus was to curtail ballooning current account deficit through promote agricultural and petroleum products exports. Since 2007 after her accession to WTO, Vietnam realised drastic FDI growth and private sector led-industrialisation (Chang et al., 2016, p. 93). The industrial sector is among largest contributors to Vietnam’s GDP. The country invested heavily in infrastructure and human capital. World Bank’s 2021 statistics indicate that industry’s contribution to employment and GDP was 33.7% and 27.4% respectively.

3.2.8.1 Apparel Industry

Historically, the garment and textile industry because of its labour-intensity acted as the entry points for manufacturing and the industrialisation process (Tregenna, 2015). The industry

⁴⁴ For North Vietnam only.

was leading during Britain's Industrial Revolution (Clark, 2007; Mokyr, 1992). Thanks to Industrial Revolution and technology upgrading, textile industry's upstream processes such as spinning, weaving and dyeing were transformed to capital-intensive, yet its downstream processes remain labour-intensive (Fukunishi & Yamagata, 2014).

Apparel or garment production contributes the largest to Vietnam's economy and manufacturing sector and since early 1990s, apparel industry grew rapidly. It is the largest manufacturing-based and commodity-based exports, and in 2011 it contributed over 14% (Goto, 2014), and between 12% to 14% from 2012 to 2017 (Nhung & Thuy, 2018) to Vietnam's total exports. Vietnam's exports value of textile and garment products global ranking is fourth after Bangladesh, India and China, and the sector contributes around 12% and 5% to Vietnam's manufacturing employment and total workforce respectively (Nhung & Thuy, 2018). Thanks to access to foreign markets and low labour costs, Vietnam's garment and textile sector grew by 17% between 2014 and 2019 and its export earnings in 2019 were US\$39 billion accounting around 16% of GDP (Nguyen, 2020). However, investment in latest technology can boost output productivity, quality and competitiveness in the sector.

Nearly 180 countries, including EU, Japan, South Korea and USA are main importers of Vietnam's garments and textile (Nhung & Thuy, 2018; Van Tot, 2014). This shows that the industry is growing and gaining competitive advantage because these markets are often characterised with more stringent rules, product quality controls, requirements and standards.

Despite great opportunities and potential to cultivate and produce cotton inputs for local industry, Vietnam still gets most of the cotton from other countries. It imports over 80% of garment inputs from Taiwan, South Korea and China others countries, thus escalating trade deficit. In 2019, it imported 89% of fabrics of which 55%, 16%, 12% and 6% was from Taiwan, South Korea, Japan and China respectively (Nguyen, 2020).

Government established the "National Textile and Garment Group" in late 1995, which coordinates, integrates and spearheads skills development and technical knowhow in the sector (Chang et al., 2016, p. 93). Government offered various incentives like tax and exemptions on imported garment and textile-related raw materials to companies producing for exportation. It established EPZs and industrial parks to attract potential foreign textile and garment investors.

Furthermore, the sector enjoys easy access to government inputs and few barriers to entry barriers (Van Tot, 2014). Thus, there are over 6, 000 companies actively participating in the sector. Vietnam Development Bank, a state bank, also offers loan guarantees and financial support to industries engaging in R&D activities and technology transfer and capacitates scientific and technological institutions with modern equipment (Anh et al., 2014, p. 250).

Nevertheless, government is still failing to incentivise foreign apparel manufacturers to use local inputs. Besides, the sector still heavily depends on buyers' engineering specifications because local apparel manufacturers lack own product brands or designs. Also, garment manufacturers lack latest technology and innovation, do not engage in R&D and upgrading, thus finding it increasingly difficult to compete internationally. They have to upgrade their functions, products and processes to compete globally and pay attractive wages to attract experienced and skilled workers (Goto, 2014).

Since most of inputs in the sector are from China, when China suspended most of production in January 2020 to combat COVID-19 pandemic it greatly affected Vietnamese textile and garment industry. The industry also cancelled many orders from lucrative markets because demand crashed when many countries instituted lockdowns and stay at home policies. However, government extended tax exemptions on imports of components, raw materials and supplies needed for producing export products to help textile and garments manufacturers and lessen damages of COVID-19 pandemic on the industry (Nguyen, 2020).

3.3 INDUSTRIAL POLICY IN SELECTED AFRICAN ECONOMIES

In comparison with other regions, Africa has relatively low formal industrialisation and structural transformation. This is evidenced by LDCs and developing countries' microscopic share of global manufactured exports (UNIDO, 2019, p. 88). Furthermore, Africa participates in the low and labour-intensive activities of GVCs. Africa's exports of manufactured products were around 36-55% between 1995 and 2019, which was the lowest in comparison to other regions (Edwards, 2020), while its manufacturing products imports are more than 50%.

Most African countries are LDCs and developing. However, some African countries show some efforts in implementing industrial policy as a springboard to their economic development.

What is more, countries like Ethiopia, Botswana, Mauritius, Morocco, Rwanda and South Africa showed some economic success ever since they attained political independence over the decade. Nevertheless, Africa's industrialisation and economic development remain elusive. With good industrial policy, Africa can gradually industrialise and could possibly create positive spillover effects on economic development.

According to Mbate (2016, p. 89); Oqubay (2015, pp. 55-56) and UNCTAD and UNIDO (2011, p. 10), Africa's industrialisation and industrial policymaking processes went through three different stages namely; ISI (1960s - late 1970s), SAP (1980s - 1990s) and poverty reduction strategy papers (PRSP) (from 2000s). ISI was a pure industrialisation phase since its aim was to drive the industrialisation process through extensive government support and protection of domestic firms from foreign competitors. It was also during ISI phase when the late Julius Nyerere introduced *Ujamaa* concept, a socialist ideology that shaped Tanzania's socioeconomic development policies after independence. ISI failed due to poor policy adoption, macroeconomic policy and public enterprise mismanagement, under-development and under-investment in export sectors and neglecting high productive agricultural sector (Oqubay, 2015). Nevertheless, there were slight notable success stories of ISI in Mauritius and Zimbabwe as domestic firms accumulated and invested resources to develop exporting industries' capabilities (Lall & Wangwe, 1998).

The other phases were not industrialisation, but they rather disrupted and distorted industrialisation and caused failure in building and strengthening domestic firms' capabilities. Upon World Bank and IMF advice, most LDCs abandoned industrial policy to adopt SAP and Washington Consensus reforms. These were through coercion to meet certain uncomfortable conditions. Africa showed some growth during the early years of SAP, nevertheless this growth was not sustainable, unaccompanied by industrialisation and structural transformation and failed to improve living standards and create high-income and high-productivity jobs (Dinh et al., 2012). SAP and liberalisation reforms eroded little industrialisation gains realised under ISI. Under SAP African economies did not realise meaningful structural transformation, but experienced economic stagnation, decline in agricultural productivity and premature deindustrialisation (Jomo et al., 2011; Jomo & von Arnim, 2012; Padayachee, 2010; Riddell & Coughlin, 1990). Through SAP reforms African countries were to phase out state intervention and support for manufacturing

sector. These eroded Africa's industrial base and concurrently weakened its efforts to diversify economic activities (Jomo & von Arnim, 2012; Mkandawire, 2005; Soludo et al., 2004).

After SAP failed neoclassical economists advocated for PRSP and Millennium Development Goals, which meant to correct socioeconomic ills caused by SAP. Nothing in SAP was fundamental to addressing industrial development kwashiorkor. Yet, addressing structural transformation and industrial development deficiencies could enable LDCs to address socioeconomic problems (Amsden, 2009; Ocampo et al., 2009). PRSP supported social areas like education and health while neglected to build and capacitate productive sectors like manufacturing and industry. Unless Africa embraces developmental state that supports industrial policy, it would be very difficult to attain structural transformation and sustainable economic development (Mkandawire, 2001). African countries should prioritise building industrial base and capacity through selective industrial policy (Wade, 2009). Nevertheless, success of development plans and industrial policy lies in appropriate designing and implementation, mobilising citizens to commit and work around the policy, strong institutions and effective but visionary political leadership and policymakers (Oqubay, 2015, p. 61).

This section examines industrial policy experiences in Ethiopia, Morocco, Rwanda and South Africa. We chose these countries because they have shown promising steps towards industrial policy design and implementation success. Hence, in comparison with their African counterparts, these countries made some industrial progress. However, these countries' progress is miniscule to that of Asian economies in designing and implementing industrial policy in certain industries, there are valuable lessons for other economies. Despite the little success in industrialisation and industrial policy designing and implementation, they can still provide valuable lessons to other LDCs and positive implications regarding their policies and strategies.

3.3.1 Ethiopia

Unlike Angola, Chad, Mozambique and Nigeria, whose growth rates have been highly stimulated by natural resource boom, apart from Rwanda, Ethiopia's GDP steadily grew high for over a decade exclusively not driven by natural resources extraction. Among low-income countries, Ethiopia is exceptionally among LDCs in recent years that formulated and implemented a comprehensive and practical industrial policy (Altenburg, 2010; Gebreeyesus, 2013). It is one

African country that demonstrates that activist industrial policy and activist developmental state can work in LDCs. Ethiopia's practical industrial policy implementation is a demonstration to policymakers that industrial policy requires clear and proper designing and implementation instead of just listing down intended or desired goals. World Bank data reveals that Ethiopia recorded annual average growth rate of over 10% between 2004 and 2019. This massive growth is partly attributed to activist industrial policy and ambitious developmental state (Oqubay, 2015). These are good news given that Ethiopia was known for conflicts and famine, but is now working on transformation and development. Nevertheless, full structural transformation and industrialisation remain elusive.

Agricultural products namely; coffee, cut flowers, khat, oilseeds, meat and meat products, pulses and leather and skins, constitute about 80% of Ethiopia's total exports, therefore climate change adversely threatens export earnings and food security (Altenburg, 2010). Ethiopia's manufacturing exports include beverages, clothing, footwear and semi-processed hides, and all these are agro-related. Ethiopia's manufacturing sector was ISI dominated, and in 1950s and 1970s it contributed 1.5% and 5% to GDP respectively (Oqubay, 2015, p. 62). The sector has weak backward and forward economic linkages, is resource-based with small firms dominating, and it produces mainly consumer, labour-intensive and low-technology goods.

Ethiopia's development policies is broadly classified in three phases; "import substitution and private sector-led with foreign enterprises dominance (1950s-1974), import substitution state-led with more state-owned enterprises (1974-1991) and export-orientated and private sector-led with strong state role (from 1991)," (Gebreeyesus, 2013, p. 4). The first phase targeted cement, food and textile industries, and prioritised foreign investors while the second and third phases targeted basic industries and agro-processing, cement, leather and textile industries but the state and private sector were major players. Government intervened in each phase through various policies and governance process. In phase one, government offered preferential credit schemes and economic incentives, imposed protection, prohibited certain imports and increased tariffs to domestic firms; in phase two, offered preferential funds and subsidies to state enterprises and used tariffs and quotas to protect domestic market; and in third phase, offered direct support to particular export firms and provided various economic incentives and preferential credit schemes to priority sectors (Gebreeyesus, 2013, p. 6).

Since 2000, government attended to economic transformation by engaging in public infrastructure investments and offered incentives to support agriculture and promote exports. From 2002, Ethiopia implemented industrial development strategy, which promoted industrial development by targeting export and agriculture sectors and generated employment from labour-intensive industries (Oqubay, 2015). Government also offered soft loans and subsidies, land lease rates and tax incentives to priority exporting firms. Consequently, to promote and speed industrialisation and structural transformation and build implementation capacity in leading sectors, government launched Growth and Transformation Plans (2010-2015) and (2015-2020). The two plans prioritised manufacturing industries with high production linkages, potential to boost exports and low technological entry barriers, such as agro and meat processing, construction, garments and textiles, leather and leather products and pharmaceutical (Chang et al., 2016, p. 103).

Although the flower industry quickly emerged successful through government support, primarily, the leather and textile industries were the most targeted sectors by the Ethiopian policymakers. In each sector, the government established supporting institutes that are responsible for effectively coordinating value chains, efficiently ensuring that firms get the supply of raw materials in time and assisting firms with technological upgrading especially in sectors where there is technological gap and limited capacity.

Ethiopia's industrial development plans closely resemble Taiwan and South Korea's and to some degree Japan's. Ethiopia occasionally invites experts from these countries to give advice and help draft national and sector industrial policies. Its industrial development policies encompass capital accumulation through targeting agriculture productivity and stimulating demand for manufactured products, offering incentives to export-oriented firms, rewarding and penalising enterprises that fail to meet agreed targets, promoting export-oriented industrialisation, restricting private land ownership, creating state development bank that supports industrial activities and controlling cash cow industries (Altenburg, 2010). Government directly and actively intervenes in industrial policy because it wants to improve state of infrastructure and human resource capacity, combat rampant market failures and also private sector is incapacitated to effectively spearhead industrial development (Oqubay, 2015, p. 95).

Government controls key state enterprises such as air travel, power generation, telecommunications and banking sectors. These are key instruments and strategies to effective industrial policy implementation. Government uses revenues from telecommunication industry to develop railway line, which stimulates and enables structural transformation. There are state-owned banks comprising, one commercial and one development bank, which are sources of cheap credit for companies in strategic and export industries like cut flower, leather and textile and garment. However, limited capital base, bureaucratic inefficiencies, information asymmetry and lack of human resources and institutional capacity affect effective promotion of industrial development (Oqubay, 2015). Government in recent years, complemented domestic finances by welcoming foreign investments, particularly Chinese, Indians and Turkish.

Government also established sector-specific technological institutes, set up centralised quality management systems and introduced programmes that encourage close cooperation between technical universities, technical and vocational training and industries. It also enhanced export performance and productivity through introducing industrial upgrading programmes (Altenburg, 2011). It built “Renaissance Dam” - Africa’s biggest hydropower project, which will provide uninterrupted supplies of electricity to manufacturing sector. Box 3.2 contains an explanation of how Ethiopia uses industrial policy and state intervention to stimulate economic development and structural transformation.

Box 3.2: Ethiopia's Industrial Policymaking and Implementation

Ethiopia's industrial policy is not confined to a one country-model. Ethiopia focuses on models where industrial policy implementation was successful. The education system (universities, colleges and technical and vocational education system) resembles German education system - apprenticeship model, which grasps industrial and technological development. The education system promotes industrialisation by supporting business and industry, and cherishing vocational and applied type of learning (Yülek, 2018, p. 214). Ethiopia brought German experts and officials to assist developing and reforming education system and tailor-made it to meet business and industry needs. Development of Ethiopian aviation industry mimics USA model.

Ethiopia also develops industrial parks and SEZs along various development corridors to promote industrialisation. It learns these concepts from China, Singapore, South Korea and Vietnam who used them to successfully industrialise. Nevertheless, Ethiopia is not copying, but is learning and developing the knowledge to suit local requirements that are supported by a home-grown and pragmatic long-term vision. According Oqubay, a developmental state and activist industrial policy are not causes of development failures in LDCs as neoclassical economists suggest, but lack of discipline by the state is the cause. State enterprises should not be insulated from competition because competition drives them towards improved performance. Industrial policy success is based on identifying practical challenges and be able to solve them with practical solutions.

Source: Interview from Honourable Minister Arkebe Oqubay.
<https://www.youtube.com/watch?v=yiIVhg6KAc0>

3.3.1.1 Leather and Textile Industry

Leather and textile industries are among sectors with widespread attention in Ethiopian policymaking framework. The sector generally does not involve sophisticated technology, but more labour and strong linkages with agricultural sector (Chang et al., 2016, p. 104; Gebreeyesus, 2013, p. 26). It is among promising industries within manufacturing sector and has considerable

potential to reduce poverty due to strong linkages with upstream rural economic activities. Ethiopia, compared to her competitors has relative comparative advantage in leather industry because of its livestock herd comprising cattle, goats and sheep, is largest and 10th in Africa and world respectively.

Despite these advantages, the industry underperforms and lags behind Nigeria in exporting processed and semi-processed leather, while Tunisia and Morocco dominate the entire African market (Oqubay, 2015). For many decades, the industry earned countless export revenue, but in comparison with cement, floriculture and coffee industries, it has not been able to contribute significantly to Ethiopia's employment, exports and total output. Ethiopia's share of leather exports in Africa and world is minuscule. Comparative advantage has no benefits if is not supported by good implementation of sector-specific strategies and appropriate technologies. It faces major setbacks from poor quality of exported leather and processed hides and skins (Dinh et al., 2012), poor animal husbandry practices due to backyard slaughtering, poor handling and branding of hides and skins (Gebreeyesus, 2013), competition from cheap Chinese synthetic shoes imports (Altenburg, 2010) and unreliable supplies of good quality and low cost raw materials (Oqubay, 2015). Peasant rural farmers also supply leather and cattle but they lack good agricultural practices and appropriate storage and transportation facilities, lack adequate treatment against diseases and ectoparasites, thus compromise quality of hides and skins. Localisation of inputs, industry upgrading, value addition, process design and product design and development are among challenges in the industry (Oqubay, 2015).

The industry also faces immense pressure to abide by environmentally friendly leather producing ways. Chrome is efficient and cost effective for tanning purposes, yet lobbying to prohibit its use is rising. Also, many sub-sectors constitute the industry, making it very difficult for government to design and implement industry-specific support and policies to tackle bottlenecks and challenges faced by stakeholders. Government makes inroads in establishment of industrial zones, dry ports, economic operators and multi-modal transport system to improve logistics. However, landlockedness and infrastructure bottlenecks remain binding constraints causing inefficient logistics and poor trade facilitation, thus affecting the industry and manufacturing sector (Oqubay, 2015, p. 227). The industry will not thrive international

competition unless government addresses these problems at every stage of leather industry's value chain.

Government created Leather Industry Development Institute to confront some of leather industry's challenges. The institute spearheads establishment of a technology institute, a training centre for leather and leather-related products. Government also capacitated chemical industry to enable uninterrupted supplies of chemicals and vaccines to boost skins and hides quality. In 2008, government pronounced a 150% export tax to discourage raw skins and hides exportation and spur industrial upgrade and value addition. It extended this tax to semi-processed leather. These greatly affected leather export revenue for a while but it later rose. Government also arranged twinning programmes for local leather producers with German technology centres and Indian institute to improve competitiveness by exposing them to latest technology, market information and technical assistance (see (Abebe & Schaefer, 2015, p. 134)).

To succeed in leather, Ethiopia should institutionalise industrial policy in its national development strategies; institute clear objectives, strategies, measurable targets with timelines, carry out monitoring and evaluation at regular intervals, address infrastructure deficits, maintain close collaboration between state and private sector, upgrade skills and technology and arrange capacity building programmes (Mbate, 2016). Government should not predetermine priorities for industries in its policy, but should instead create incentives and develop skills to encourage and develop innovation (Altenburg, 2010). Industrial policy should develop manufacturing sector to generate exports, stimulate structural transformation and accelerate catch-up (Oqubay, 2019).

3.3.2 Morocco

Morocco's manufacturing sector is traced from 1960s. From that period to early 1980s, economic policies followed ISI and high protection comprising tariffs, import licenses, foreign exchange controls and import quotas (Achy, 2013; Ali & Msadfa, 2016). Between 1980s and 1990s, Morocco shifted from ISI to Washington Consensus to embark on privatisation and liberalisation. The shift exposed manufacturing sector to foreign competition, and MVA share steadily declined. Morocco signed several trade agreements with many countries. It has geographical proximity to European (its major exports destination) and Asian markets. These advantages attracted leading international firms in aviation industry and manufacturing sector to

establish sophisticated factories in Morocco. However, the sector is less diversified with industries that rely heavily on unskilled labour and natural resources constituting about 60% of MVA (Achy, 2013).

Nevertheless, government prioritised manufacturing sector to help diversify its potentials in exports. It also pushed for creation of employment by diversifying production capacity of industrial sector and executing series of programmes to promote industrialisation. In 2005, government launched an “Emergency Program” called “National Pact for Industrial Emergence (PNEI)” (2009 – 2015), which targeted mostly aeronautics, automobile, electronics, food and textile industries (Ali & Msadfa, 2016; Hahn & Auktor, 2017). Government ensured success of this program by establishing vocational training centres, which provided direct assistance to these industries. It further launched an Industrial Acceleration Plan (2014-2020), which was a refinement of PNEI. The plan sought to facilitate acquisition of finance and capita for industrial projects, increase access to land and improve quality of training for aerospace, automobile, chemical, pharmaceutical industries and others (Mokri, 2016). Government established SEZs and industrial parks and invested in infrastructure like ports, railway and road. These facilitated logistics and reduced transport and trade costs, thus making Morocco an attractive centre for investment and manufacturing. It also created production clusters and linkages in manufacturing sector targeting aeronautic components, agro-industry and automotive industry.

In 2017, automotive, agriculture, phosphates and textile and leather industries contributed to Morocco’s exports about 24%, 21%, 18% and 15% respectively. Furthermore, in 2021, manufacturing production rose significantly and was the strongest since 2000. Contributing to this significant growth were automotive (85%), clothing (48.9%), electronics (69%), leather (32.5%), metallurgy (98.3%), rubber and plastic (79%) and textiles industries (44.3%). With these statistics, Morocco is on the global manufacturing map.

3.3.2.1 Automobile Industry

The industry is very strategic to Morocco’s economy due to its high potentials to promote industrial development, generate exports revenue and create employment and industrial linkages. The industry surpassed phosphate industry, the country’s long-time traditional exports contributor to become the main contributor. Automobile exports rose by 134% from 2.3 billion euros in 2012

to 5.4 billion euros in 2017. OICA data shows that Morocco's automobile annual average production between 2005 and 2018 grew considerably by 30%. The industry's annual investments and exports also grew by a double-digit. Morocco hosts Renault, the first and main vehicle OEM in the country. Other OEMs like PSA Peugeot-Citroen and China's BYD have operations in Morocco. Renault's operations in Morocco are the largest in Africa, and continues to make significant investments. Renault's presence attracted many suppliers and manufacturers, who invested in improving standards and developing skills Morocco's automobile industry. About 80% of Morocco's automobile exports find their way in Europe, and for obvious reasons France commands the largest share.

In 1999 and 2009, Egypt's automobile was the largest in North Africa representing 13% and 14% of Africa's total production while Morocco's was 7% and 11% respectively. In 2019, Egypt contributed a mere 2%, yet Morocco had 36%. Nevertheless, since 2001 and 2012, Morocco outperformed Egypt and became Africa's second largest automobile sales and production hub respectively behind South Africa. Additionally, South Africa also commanded 75% and 74% in 1999 and 2009. Nevertheless, its 2021 production was 54% while Morocco's rose to 43%. It also leads in passenger car manufacturing. In 2018, Moroccan automobile industry ranked 2nd and 27th automobile producer in Africa and world respectively. Fitch Rating predicted that between 2020 and 2025, Morocco's automobile industry could annually grow by 17.5% on average. Given Morocco's market advantage and growth rate, it will outstrip South Africa to become Africa's leading automobile manufacturer before 2025. Since 2014, the industry is the leading contributor to Morocco's exports contributing 25% in 2019.

Notwithstanding these developments, Morocco's automobile industry is still limited to low-value and labour-intensive activities that include assembly and wiring, but has gradually moved towards higher-value activities like vehicle engines in recent years (Hahn & Auktor, 2017). The change towards high-value added activities reduced automobile's import-export ratio in value from above 20 in 1998 to 1.4 in 2016 (ibid). Morocco lacks high investments in R&D, technological upgrading, learning and knowledge transfer from foreign automakers, domestic capabilities building and localisation strategy, and up to date does not produce its own vehicle brand.

Moroccan automobile industry has been in existence since 1959, and around 1960s, it was only producing auto parts. During these periods, it was only found in Casablanca. Nevertheless, PNEI programme spread it to Tangier and Kenitra locations. It is still highly concentrated in Tangier and Casablanca. The two cities boast around 40% each and over 90% combined. Government adopted and implemented *Loi de Valorisation*⁴⁵ in 1968 as its first major policy towards transforming automobile industry (Hahn & Auktor, 2017).

Government launched Tanger Free Zone in 1999, the first port free zone in Morocco and 6th in the world. The zone hosts over 500 companies in automotive, logistics and other industries, and has an excellent port, which ranks 31st globally in maritime transport connectivity. Companies intending to set their shops in the zone receive various incentives like tax exemptions. The port also connects to 180 global seaports and 74 countries with a capacity to handle and process nine million containers, 700 thousand trucks and one million vehicles. Government established another zone in Kenitra (Atlantic Free Zone), which has free zone and open zone for exporting firms and local market respectively. The zone mainly targets automobile industry, but include other key industries.

Ministry of Industry develops and executes Morocco's industrial policy. However, other public and private sector actors are involved. PNEI programme compelled second and third-tier suppliers and more international vehicle manufacturers to invest and establish in Morocco, and develop capacity for specialised assembly (Hahn & Auktor, 2017). Government offered up to 10% support to second and third-tier components suppliers for investing within free zones and training employees. Government conducted training programmes for new auto-manufacturers and offered them land (about 300 hectares) to build production facilities. Government also offered general incentives that included banking, health care, logistics and engineering services in Tangier and Kenitra locations to improve industrial parks' attractiveness. It also supported specialised training programmes for engineers, management, operators and technicians in automobile to develop and enhance competitiveness of Moroccan automobile industry.

Nevertheless, Moroccan automobile industry still faces some challenges, among them lack of economies of scale, budgetary support for R&D, local integration, synergies with other

⁴⁵ The regulation obliged at least 40% of the components of vehicles assembled to be sourced and produced locally.

industries and technology, inhibit development. Thus, deepening local integration, synergies, R&D and technological upgrading are key for industrial development. To develop automobile industry, Morocco should improve learning and development, strengthen capabilities for local firms and intensify knowledge transfer from established foreign firms to local firms. It should also enhance second and third-tier vehicle components suppliers' capabilities, particularly small and medium enterprises so that they conform to international standards, increase economies of scale and have technical expertise to efficiently compete. This way Moroccan automobile industry can be able to manufacture its own vehicle brand.

3.3.3 Rwanda

Rwanda is on course to make significant progress in income, productive capacity and economic structure. It is among few LDCs with a clearly defined and consistent national development strategy with clear set out targets and vision. It implements policies it designs in practice. Its policies provide answers to its development needs. Rwanda's Vision 2020 strengthened development strategies through developing infrastructure, investing in education and agribusiness, facilitating and promoting investment and trade, privatising and integrating with international community. Integral to Vision 2020 was a knowledge-based economy, with ICT as a crucial component to develop education system. Government promoted and oversaw infrastructure development and private sector investment for ICT development and dissemination. It realised that to achieve these required improving education and training of scientist and technicians. The implementation of Vision 2020 was in four phases. Phase one sought to develop knowledge-based economy by centring on ICT (2001-2005), phase two aimed to strengthen phase one (2006-2010), phase three focused on developing ICT-based products and services globally and sustaining ICT development (2011-2015) and phase four sought ICT to spur economic transformation to middle-income (2016-2020) (Harrison, 2005, p. 6). Furthermore, the country launched Vision 2050, which runs from 2020 to 2050, with planned regular reviews every 5 years. Vision 2050 is in harmony with international, continental and regional development plans, and it is an intensification of the country's drive towards competitiveness and self-reliance.

Rwanda is not stuck to the dark and past following the 1994 genocide which claimed over one million people's lives. Despite this tragic history, it is rewriting its story by turning tragedies

into opportunities. Rwanda is very serious about development policies. Its GDP per capita \$798 in 2020 compared to \$125.5 in 1994. Between 2000 and 2019, Rwanda's growth rate averaged 8%, consequently lifted over one million people out of poverty. In 2008, it established the Rwanda Development Board with a mandate to provide advice and support to private sector to ensure development. Nevertheless, most of its policies are too broad without targeting specific manufacturing industries. Unsurprisingly, its share of MVA between 1990 and 2018⁴⁶ averaged 7%. However, it ranked 1st and 38th in Africa and world in doing business rankings in 2020. Rwanda is making considerable efforts in tourism and ICT-based services sectors. It is among countries with high population growth rate, and because of that there is high competition for arable agricultural land. Rwanda understands the direction in which the global economy is taking and it believes diversifying towards ICT and knowledge-based industries present an opportunity to combat lack of natural endowments and drive development.

3.3.3.1 ICT-Based Services Industry

ICT is key for economic transformation and development. It cuts across several SDGs and economic sectors. A vibrant ICT is cardinal for human capital development and structural transformation. ICT is key in advancing education and human capital development. The 4th Industrial Revolution is fast changing production and other economic activities. It is gaining momentum and demands countries to embrace innovation and technology pertinent to solving people's problems. Today's world economy and development is highly knowledge-based. ICT is key in shaping this process. The COVID-19 pandemic disrupted daily lives, education, sporting events, tourism, travelling and work. It subsequently increased electronic gadgets usage and demand and internet usage. ICT affordability and accessibility make learning easier and accommodate people disadvantaged by geographical circumstances and remoteness. However, transforming ICT potential into a reality, implementing and integrating ICT policy in education, building supporting infrastructure and making electronic devices affordable to facilitate inclusion remain great challenges for Africa. The continent's structural transformation hopes lie in ability to quickly adopt innovation and take entrepreneurship seriously (Verd, 2019).

⁴⁶ <https://stat.unido.org/country-profile/economics/RWA>

Rwanda's formal ICT process began in 1998, followed by three ICT policy reports in 1999, 2000 and 2001 (Esselaar et al., 2001). It is striving to become a focal point and gateway or Singapore of technological advancement in Africa. It is committed economic transformation through ICT development. Government prioritised internet connectivity and encouraged science, technology and mathematics learning, hence ICT became part of a broader framework within Rwanda's Vision 2020. The Vision sought to expedite information and knowledge to the citizens. Rwanda dedicates efforts to invest in ICT facilities and services and human capital development as sustainable means to foster economic and social development and transform from agriculture-based economy to a service-oriented one (Kimanuka, 2009). During Vision 2020 programme, government offered special tax incentives targeted at speeding up and broadening ICT growth. It also helped establishment of Rwanda Terracom in 2004, which installed fibre optic network in government buildings, schools and hospitals in major Rwandan cities. Today, Rwanda's internet connectivity and network coverage are excellent, and is among Africa's best three.

In 2008, government launched the "One Laptop Per Child Programme" aimed for every primary going child to own and use a laptop (Gutterman et al., 2009), and to see all the population having internet access and standard ICT tools in the next five years. However, the programme was hampered by insufficient distribution of ICT equipment in schools and lack of trainings to teachers (Sylvestre et al., 2018). Also, government lacked financial capacity to develop human capital and build ICT infrastructure (Byungura et al., 2016). In 2013, Rwanda installed a 2,300 km fibre optic cable to provide high speed internet access. Rwanda accelerated ICT industry development and launched Kigali Innovation City (KIC) in 2016 to expand its drive for transforming to a knowledge-based economy. KIC is an innovation effort and technology hub focusing on technological advancement and high-technology eco-system centred on innovation and talent. The innovation city is first ever in Africa and is a monumental milestone for Africa. It is among Rwanda's major projects aimed to transform economy from agrarian-based to a knowledge-based one and enable digital transformation.

In October 2016, Rwanda partnered with Zipline Incorporation, a robotics company based in California, to launch the drone technology to deliver blood and medicines supplies in very

remote and mountainous places of Rwanda⁴⁷. Furthermore, in 2019, government and Africa50 established a joint venture to invest around US\$400 for constructing, developing, financing and operating KIC's commercial components. Government further launched National Strategy for Transformation, which spans from 2017 to 2024, and its pillars to enable economic, governance and social transformation⁴⁸. It also infused ICT in most of its administration areas that encompassing application and issuing of licenses and permits and registration of companies. With the infusion of ICT in most government departments, the country seeks to migrate from the traditional way of doing government business to make all documents issued by the government applicable and accessible online. The success of all ICT-based programmes heavily relies on the numerous supports that the government receives from willing private donors.

However, having ICT potential does not lie in just introducing ICT infrastructure and internet gadgets in schools, but requires building the capabilities of students and teachers who can exploit technological advancements and software development beyond just using computers as taught or in the classroom context (Rubagiza et al., 2011). Policymakers should ensure sustainability by targeting creating and developing technology and innovation instead of just adopting and using borrowed technology from other countries. Government should also formulate proactive policies that stimulate new technologies and innovation diffusion throughout the economy (Aubert, 2018). Rwanda's ICT development requires significant investments in quality education, improvements in institutions of higher education and sufficient time for ICT to grow (Kano & Toyama, 2020). Beyond these, government should support firms in ICT, promote international exposure to benefit from brain circulation and promote practical university education to enhance experience (ibid).

Rwanda offers various special incentive packages to promote investment in ICT industry. These include exempting most IT equipment from value added tax, and offering a 15% tax rate on corporate income and a seven-year period corporate tax holiday⁴⁹. Rwanda made strides to develop ICT, but should build and diversify towards manufacturing products because of their great scope

⁴⁷<https://www.weforum.org/agenda/2019/01/what-the-world-can-learn-from-rwandas-approach-to-drones/>

⁴⁸ [ICT SECTOR PLAN 18-24 .pdf \(minict.gov.rw\)](#)

⁴⁹ <https://rdb.rw/investment-opportunities/ict/#tab-1-3>

and potential for innovation and technology, high productivity and high degree of tradability and capability to create high-quality jobs (Chang et al., 2016).

3.3.4 South Africa

South Africa made great strides to diversify its economy and improve its manufacturing sector. It has the most advanced infrastructure, diversified economy and exports, developed manufacturing sector and sophisticated capital markets in Africa. Nevertheless, its MVA has been stagnant averaging 13% between 1990 and 2018.

South Africa's industrial policy genesis is traced to the time of promoting indigenous steel industry around 1920s, which was centred around import substitution (Barnes et al., 2004, p. 156). Its industrialisation is in two phases namely; from 1961 to 1995, whose target was local content, and post-1995, whose target was import saving and export incentives (Barnes et al., 2004). However, according to Zalk (2014), it was in three phases, which are apartheid (1976-1993), Washington Consensus (1994-2007), and post-Washington Consensus period, that is from 2007 onwards. During apartheid era, government tried to establish upstream industries without success. Developing upstream industries failed because government centred much on natural resources, particularly minerals and other commodities without much value addition on downstream industries. Nevertheless, manufacturing sector reached its peak of 22.61% in 1981, and chemicals and semi-processed metals sectors were leading. Manufacturing sector also contributed more in employment and MVA than service sector (Tregenna, 2008). However, manufacturing employment and value added decreased during the Washington Consensus era. Government rendered support to automobile, clothing and textile, steel, aluminium and other upstream industries during the same era, was not enough to propel industrialisation. The period involved liberalising key industries, binding regional and international trade agreements and privatising state-owned enterprises, which adversely affected many industries' competitiveness contributing to deindustrialisation. Lack of structural transformation and manufacturing's poor performance led to decline in exports, employment and economic growth (Hausmann & Klinger, 2006; Rodrik, 2008). In 1990s, services had the largest contribution, nevertheless, manufacturing used more inputs (had greater growth pulling effects on services than what services do to manufacturing) from services (Tregenna, 2008). The country's manufacturing sector is labour

intensive. A slowdown in manufacturing sector's performance has pronounced effects on employment growth.

Government tried to extend support to many industries, but this was beyond capabilities and resources thereby failing to effectively implement industrial policies to targeted sectors (Kaplan, 2004). In mid-1990s, South Africa tried to diversify from non-tradable sectors to manufacturing, shift towards knowledge-based sector, generate employment by focusing on labour-intensive manufacturing sector and industrialise marginalised areas by including disadvantaged people (Zalk, 2014).

However, deindustrialisation started around 1990s. Subsequently, government aligned every industrial policy with innovation, macro and skills policies, industrial sector and procurement by public and private sector to restore industrialisation to apartheid era levels (DTI, 2011). Nevertheless, weak subsector dynamics in technological change resulting from overdependence on growth anchored on domestic demand expansion contribute to deindustrialisation (Tregenna, 2012).

South Africa's industrialisation still lies on formulating clear vision on policies, complementing demand-side policies with supply-side policies, investing substantially in infrastructure, establishing coherent and coordinated policies and improving administrative and institutional capabilities (Chang, 1998). Goals and objectives incoherence of both industrial policies, other policies and responsible departments, lack of collaboration between implementing institutions and business, skills and training and government capacity hinder South Africa's industrial policy success Kaplan (2007).

Government formally included industrial policy when it introduced National Industrial Policy Framework in 2007 (Department of Trade and Industry [DTI], 2011; Zalk, 2014). It is from this period South Africa adopted sectoral strategies. The policy sought to intensify and consolidate industrialisation and facilitate diversification. It identified constraints affecting manufacturing sector and industrialisation. It targeted to develop automobile, boatbuilding, clothing and textile, oil and gas and iron and steel industries. Among production-driven sectors in 2010, manufacturing contributed 54.4% to GDP, with automobile industry contributing the highest (DTI, 2011). Also, manufacturing output value registered a break recording of US\$49.95 billion in 2011. Stable

economic environment, strong institutions, participation in GVCs and sector-specific support and industrial policy contributed to industrial development and economic improvement during this period (Moyo, 2016).

South Africa has the most advanced manufacturing sector in Africa, and within that is the automobile industry. The automobile industry is key to the country's industrialisation landscape. Nevertheless, the industry faces immense competition from other automobile producing countries, particularly emerging countries, which enjoy competitive, location and low-cost advantages. Like other automobile industries world over, South Africa's automobile industry experienced unprecedented challenges caused by COVID-19 which halted production and trade activities.

3.3.4.1 Automobile Industry

The industry has the largest contribution to South Africa's manufacturing sector. It is among main contributors of revenue. From 104 sectors in South Africa, it was the fifth largest exporting sector claiming 15.5% of all exports and 27.6% of manufacturing output in 2019. Since 1999, it has been contributing largest automobile production and sales in Africa. International automobile manufacturers dominate South Africa's automobile export industry. FDI is key to automobile industry since all OEMs are foreign-owned. The country has to address competitive weaknesses caused by shortage of skilled technicians, labour market bottlenecks, low supplier depth and insufficient R&D (Alfaro et al., 2012).

South Africa's industrial policy during apartheid era was too general in nature with no standalone policy for automobile industry. Import substitution, state ownership of companies, protectionism, incentives and local content programme dominated policies and were key policy instruments. Local content programme was weight-based and value-based in some periods, and its aim was to reduce foreign exchange burden and transform the automobile industry from low-end assembly operations to full scale manufacturing (Alfaro et al., 2012). Automobile production in 1924 was 13, 000 units, but steadily grew to 57, 500 in 1939 (Lamprecht, 2021). Policies related to automobile industry between 1961 and 1994 were in six phases (Alfaro et al., 2012; Damoense & Simon, 2004; Lamprecht, 2021).

Phase 1 was from 1961 to 1963 and it aimed to increase LCR from around 15% to 40%, pegged import duty on vehicles at 35% and on components at 20%. On phase 2 (1964-1969), government gradually increased local content from 45% to 55%, and was based on weight. From 1971-1976 (phase 3), local content was set from 52% to 66% starting 01 January 1977. Between 1977 and 1978 (phase 4), there was a halt in local content due to global inflation and oil crisis. In phase 5 (1980-1988), local content was weight-based, 66% for motor cars and 50% for light vehicles and minibuses. However, in phase 6 (1989-1995) it was value-based from 55% at the beginning to 75% by 1997.

Motor Industry Development Programme (1995-2012) was a successor to local content programmes. The programme sought to enhance competitiveness, help, protect and integrate small firms in automobile industry with global players (Alfaro et al., 2012; Barnes et al., 2004; Lamprecht, 2021). However, government could not use LCR because of fear of violating WTO regulations. It also phased down tariffs. The programme resulted in automobile industry's share to GDP rising to 13% in 2002 from 9.7% in 1994 and also caused the industry's trade deficit between 1996 and 2001 to significantly fall from US\$3.3 billion to US\$930 million (Barnes et al., 2004). The subsequent rising of auto exports changed industrial structure.

Government further launched Automotive Production and Development Programme (2013-2020) (Bronkhorst et al., 2013; Lamprecht, 2021). Under the two programmes exports of vehicles were 2, 412, 229 and 2, 579, 612 units respectively (Lamprecht, 2021). Between 2015 and 2020, South African's automobile output exports was destined to UK, Germany, Japan, USA, Australia and France, with Mercedes-Benz, Volkswagen, BMW, Ford and Toyota topping the list (ibid). In the African region, the country's top export destination for buses and trucks has always been its neighbours, and between 2015 and 2020 Zimbabwe, Mozambique, Zambia, Tanzania and Malawi topped the list.

There are seven OEMs, 110 tier-1 suppliers, 22 companies producing cars and commercial vehicles, 21 companies importing and distributing vehicles, and about 500 companies supplying components and parts⁵⁰. South African automobile industry has the largest employment multiplier effects creating over half a million jobs and highest linkages with other sectors. Between

⁵⁰ <https://naamsa.net/industry-overview/>

2015 and 2020, the industry exported about 60% of its vehicle output. Given that the world market is changing to electric vehicles and the main export destinations announced to ban combustion engine vehicles beginning 2030, South Africa has to accelerate transformation towards electric vehicles. Nonetheless, like other African countries manufacturing a home-made vehicle brand remains elusive for South Africa.

In 2021, government launched an Automotive Masterplan, which runs until 2035 (Lamprecht, 2021). The Plan seeks to stimulate South Africa's automobile contribution to global automobile production to 1%, increase local content to 60%, enhance deepen value addition and the sector's competitiveness and increase employment. Success of the Plan requires implementing key pillars namely localisation, local market optimisation, regional market development, automotive infrastructure development, industry transformation and technological development.

Government developed SEZs and industrial parks. South Africa has 11 SEZs⁵¹ to date. Most of them are general and designated for many sectors and industries, but the one in Tshwane, Pretoria, is designated specifically for automobile industry. It is the first automobile city in Africa. In 2014, government enacted SEZ Act, which seeks to provide management, development, operation and promotion of SEZs, establish SEZ Advisory Board, establish SEZ funding and regulate applications and operations in SEZs areas.

Although South Africa and South Korea's automobile industries were established almost same years, up to now South Africa does not manufacture own vehicle brand, yet South Korea has many brands that compete globally (Chang, 1998). South Africa was 22nd while South Korea was fifth global vehicle producer in 2019 and 2020. South Africa has not capitalised on the presence of major America, European and Asian motor vehicle manufacturers and their experience in automobile to develop its own brand. The reasons could be difference in times of attaining independence (South Africa - 1994 and South Korea - 1948), human capital, technology capabilities and ownership of automobile companies. The industry is still highly dependent on FDI. Introducing and diffusing technology are among obstacles that developing countries can fail to overcome, and these inhibit development of South Africa's automobile industry. Given South Africa's technological gap with advanced economies, it is hard for automobile industry to graduate

⁵¹ <http://www.thedtic.gov.za/sectors-and-services-2/industrial-development/special-economic-zones/>

from assembling and manufacturing foreign brand vehicles to manufacturing own brand. South Africa has to master and learn technology and managerial skills, diffuse and digest technology and train workers in automobile industry. Except the recent Plan, previous policies did not emphasise on building local technological capabilities and localisation or developing local brand, yet these are the backbone to develop the automobile industry. Nevertheless, there is no timeframe on when South Africa will start to manufacture own vehicle brand. South Korea imported technology and had long periods of learning to make the technology work for it.

The COVID-19 pandemic affected vehicle production and sales not only in South Africa but also other countries. South Africa's automobile production and sales declined by 29.2% and 30% between 2019 and 2020. However, between 2020 and 2021, these rose by 12% and 25% respectively. Nevertheless, South Africa was in recession before COVID-19 outbreak. The pandemic aggravated problems in automobile industry and economy. Full recovery to pre-COVID-19 output and sales levels will depend on government support and economic recovery of both South Africa and her trading partners.

3.4 CONCLUSION AND COMPARATIVE ANALYSIS

Applying the case study analytical framework to examine industrial policy in selected African and Asian economies, based more on Asia's experience and partly on African examples, the findings confirm that Africa too has the potential for industrialisation and structural transformation. However, achieving these require activist industrial policy and activist state, and policymakers that properly address country, industry and sector-specific constraints. Asian economies are more advanced in industrialisation and structural transformation than African ones. Efforts to implement industrial policy across many African countries has been considerably less successful compared to Asian economies.

Among the reasons contributing to this failure are the public and private sector's lack of coordination, government departments or ministries failing to properly speak to each other regarding policy issues, lack of periodic reviews on implemented programmes and rewards or incentives without a sunset clause and lack of proper rules or referees to monitor incentives. Before dealing with firm specific issues or binding constraints affecting individual firms, African governments should deal first with country-specific constraints. These include improving general

investment climate and building the basics – world class human and physical infrastructure (removing infrastructural rigidities and improving trade logistics). Africa has the largest number of landlocked countries. Landlockedness affects competitiveness, thus building regional infrastructure could be a solution to regional infrastructural problems. Good infrastructure provides a “Big Push” to investment and industrialisation. It makes implementation of targeted government support effective and meaningful. Virtually, all African countries fall short of these basic ingredients to successfully implement industrial policy.

Manufacturing sector of African economies is small and has been struggling to grow. Nevertheless, the sector is still important for development. The steps taken by Asian economies provide a wealth of lessons for policymakers and development practitioners in Africa and other developing countries. They adopted activist developmental state and activist industrial policy through deliberately changing economic structure from low-value-added products to high-value-added and highly sophisticated manufactured products. African economies remain locked in or trapped into producing low-value-added and less sophisticated products. High technology and sophisticated products do not constitute a major part on African economies’ manufacturing exports. African countries’ industrial policy and industrialisation are along natural resource-based industries which are failing to expand beyond that, Asian economies created completely new industries. State intervention in Asian countries targeted industries with high economic linkages.

Technology upgrading was integral to industrial policies of Asian economies. Industrial policy implementation and intervention by governments of Asian economies had a strong bias towards technology upgrading. Also, Asian countries promoted strong synergies between local and foreign investors so that local firms could benefit from technology transfer from foreign firms. FDI to Asia brought a win-win situation which favoured local investors. Their governments put in place policies which promoted technology sharing and transfer between local and foreign investors. Unfortunately, many African countries tend to offer better incentives to foreign investors and neglect local investors, yet sustainable industrialisation and industrial development in many advanced countries were championed by local investors. Governments of African countries have to negotiate better FDI terms and put in place policies that ensure skills and technology transfer. Many African countries fail to effectively enforce strict regulations on technology and innovation transfer by foreign investors and multinational corporations. This creates room for abuse, bribery

and arbitrary application of regulations. Lack of strong FDI policy that stresses on technology transfer and building local capabilities is the main cause of huge differences between automobile industries of China and South Korea versus Morocco and South Africa despite having established around the same period. Asian economies successfully adopted a range of strategies with specific timelines to develop their economies and industries.

Asian economies generally applied selective sectoral industrial policies favouring certain firms or group of companies. However, implementation of industrial policy and how each government's intervention differed considerably from sector to sector. These differences resulted in different industrial and technological development outcomes and patterns between Africa and Asia. They further imply different paths of industrial deepening and technological capabilities by domestic firms. Asian governments built world-class infrastructure and availed funding to finance capital-intensive programmes so that domestic industries could effectively perform R&D activities and build industrial technological capabilities needed to develop high technology industries. These are the secrets to most Asian economies' industrial and export competitiveness and success. Intervention should not just be for protecting domestic industries' interests over that of foreigners without building domestic capabilities and absorbing technology and innovation. Lack of technology traps or locks a country into specialising in low-productivity activities thereby limiting structural change. Increasing productivity without upgrading technology is hard work without reward, and it keeps a country trapped in poverty, thus technology is smart work. Countries with technology specialise in capital-intensive industries while those without are forced to specialise in labour-intensive industries. Specialising in labour-intensive industries further limits the scope for innovation and technology upgrading.

Political leadership and bureaucrats in Asian economies had powers to make and implement decisions as they see them fit, were accountable for their decisions, were determined nationalists, built institutions with integrity and were focused and willing to work hard for their people. Strong institutions and checks and balances can minimise the risk of state capture and industrial policy implementation failure. Industrial policy failure or success arise during implementation phase, hence government can make adjustments, improvements and improvisations in response to any unexpected outcome (Cramer et al., 2020). Asian leaders remained committed despite making several mistakes and facing problems, but they pursued

policies that strengthen industrial development. No one could imagine that Asia would dominate the automobile industry in production and sales despite the west being the pioneers and leaders for the past century. Japan surpassed USA in 1980 to become the leading automobile producer globally, and China became leader in production and sales in 2009 and 2010 respectively. This is a great lesson for African countries that with commitment, focused priorities and strong institutions nothing is impossible. Industrial policy and strong institutions are defining variables between differences in structural transformation and industrialisation in African and Asian economies. These profoundly influenced industrial path and absorption rate of knowledge accumulation, learning and innovation capabilities.

Having static comparative advantage in labour-intensive industries should not stop a country from exploring dynamic comparative, which are associated with capital-intensive industries and technology upgrading. Spectators do not win the race, but only those playing have the chance to score and win. Winning a lottery requires one to buy a lottery ticket. It is through "learning-by-observing" and "learning-by-doing" can developing countries embrace technology. Participating in high-technology industries offers more opportunities to increase technological capabilities.

Natural resources abundance provides valuable inputs for downstream manufacturing industries and presents opportunities for developing countries to develop manufacturing industries along those lines. However, natural resource-based industrialisation can lead to a Dutch-disease causing manufacturing sector to shrink due to diversion and reallocation of productive resources and exchange rate appreciation due to revenue inflow. South Korea, China and Japan reached their growth apogees by expanding production of industrial and manufactured commodities (Rodrik, 2009a).

Africa should start venturing in high-value and sophisticated industries and activities such as automobile manufacturing, electronics and electrical, shipbuilding and semiconductor industries. These have high economic linkages and create more economic benefits such as poverty reduction, creation of better jobs and generation of more foreign currency. Therefore, the type of economic activity a country does defines and determines its economic development path. Catching up industrially and economically with other regions entail that Africa should more than double her

efforts and speed of development. However, this is possible when the investment climate is stable and institutions are attractive. Nevertheless, firms in LDCs can upgrade standings in GVCs through product upgrading (producing completely new but sophisticated products), process upgrading (introducing new technologies to enhance efficiency), functional upgrading (moving into more sophisticated tasks of the product value chain) and chain upgrading (moving into another chain using knowledge acquired from another chain) (Humphrey, 2004; Humphrey & Schmitz, 2002).

Also, Asian economies supported and strongly coordinated other economic policies, cooperation between implementing agents and other partners and cleared information symmetry between connected upstream and downstream industries. However, most government departments and businesses in African economies lacked strategic coordination. Asians had control over banking sector and established state development banks to properly finance industrial policy programmes.

Evidence from case studies of how economies have advanced in industrialisation and industrial policy designing and implementation may not proffer any particular policy tools or stand as best practices of development strategies that every country should use as templates. However, they only provide general representatives of what countries can draw and use depending on their economic, institutional and political environments, knowledge and technological capabilities, geographical location, policy space, resource endowments and stage of industrial development. Africa's successful implementation of industrial policy requires adequate understanding of underlying binding constraints, ability to package policies and coordinated approach from all concerned agencies and government departments.

The lessons to be learnt from these case studies is that if African countries emphasise on building a formidable political and institutional system, activist industrial policy and education and learning that prioritise innovation, science and technology, they too can migrate from the current vicious spiral of low economic development to a virtuous spiral of high economic development. Asian economies mastered that the secret to development and industrialisation lies in activist industrial policy and activist developmental state with a robust focus on engaging in higher-value-added, productive and sophisticated activities and building strong political leadership which does not tolerate corruption and incompetency. African countries and developing countries

should not remain locked in horizontal industrial policy and comparative-advantage-complying industrial policies, but can also apply selective industrial policy and defy comparative advantages and create completely new industries.

Following exactly or replicating what Asian economies did might not be possible for Africa; however, African countries can learn from Asia's experiences and get light and a sense of direction regarding economic development and industrialisation. Africa can industrialise by borrowing and adopting Asia's priorities and institutions of implementing good industrial policy and strong institutions without necessarily duplicating everything since doing so may require long-entrenched practices. However, it is not bad for Africa to borrow on how Asians managed to deal with rent-seeking behaviours.

This chapter does not seek to overstate the positive side of industrial policy and developmental state by excluding the negative and unsuccessful stories and tries to claim that industrial policy is error-free and costless. Also, by focusing on positive and success stories of the economies, the case studies do not convey an impression that their industrial policy designing and implementation was coherent and effective without any challenge. Furthermore to avoid jumping into a fallacy of composition, the findings from the case studies should not necessarily be generalised to all African countries and other developing countries seeking to establish their industries because industrial policy varies with a country's institutional, industrial paradigm⁵², economic and political environments, resource endowments, policy space, stage of industrial development⁵³ and government capabilities, thus a one size fits all approach to industrial policy may not work. The focus of the case studies was only limited to examining industrial policy and government support not evaluating them. If enough effort to analyse state intervention and industrial policy across all sectors of every country case study is done, one would find that what holds true for industrial policy and state intervention in one industry or sector may not for other industries or sectors within the same economy. In every intervention it is possible to find areas or pockets of visible inefficiency. However, this does not mean intervention is not important. It is

52 The operating environment facing firms, i.e. "techno-economic dominated paradigm, main organisational model of production and firms' main geographic scope," (UNIDO, 2020b, p. 40).

53 Early, recent and emerging because countries face a different industrialisation ladder (UNIDO, 2020b).

like water, and should be in right quantities because too much or too little of it affects life. What matters is the correct mix of policies. With a committed and development-centred leadership, Africa countries too can formulate and implement effective industrial policy as well as steer a desirable level of structural transformation.



CHAPTER 4

MODERATING ROLE OF INSTITUTIONS AND INVESTMENT

CLIMATE ON INDUSTRIALISATION'S ECONOMIC

DEVELOPMENT IMPACT

4.1 INTRODUCTION

Empirical and theoretical studies on economic development and growth have been carried out for many years. Some investigate and understand underlying factors explaining differences in long-run economic developments. Despite significant progresses, key determinants of economic development or growth are still debatable. What is more, despite having similar initial conditions some developing countries are graduating to high-income status while others are reeling in underdevelopment vicious cycles. While various factors explain these differences, industrialisation trumps them all. Thanks to industrialisation, development gap dividing less advanced and underdeveloped economies keeps widening.

Industrialisation insured development and living standards in emerging economies and the Western World. It is one source of sustained economic development. For example, South Korea and Ghana gained independence almost simultaneously and had similar per incomes. However, South Korea followed manufacturing-based industrialisation and progressed to middle-income and high-income levels in 1974 and 1995 respectively. Ghana with weak industrial economic linkages, had middle-income status in 2007 yet was stuck in low-income category over the past four decades. Also, China was agro-based economy in 1950s, but it started to transform towards industry-based in late 1970s. Consequently, China's poverty rate in 1981 was 88%, but thanks to intensive industrialisation it fallen to 0.7% in 2015.

Nevertheless, the rapid industrialisation by some countries while it is difficult for others remains highly debatable. Literature generally cites natural resources, physical capital, technological advancement, human capital and investment behind these differences. Having these is important but more important are government policy and institutions. These determine movement and efficient and effective operating environment of production factors and other determinants. Successful industrialisation is possible when the country has the right infrastructure, institutions, skills and technologies. Most Asian economies meet many of these conditions while

Africans have a deficit. Creating an enabling investment environment for private sector to fill the gaps is a step in the right direction. It is imperative to compare the role of investment climate and institutions on industrialisation's development impact in selected Asian and African economies.

Good infrastructure, institutions, right skills and technologies determine successful industrialisation. Most Asian economies meet many of these conditions while Africans have a deficit. It therefore means private sector role is key in augmenting public sector role and filling this void, thus creating a conducive investment climate is cardinal. It is imperative to compare the role of investment climate and institutions on industrialisation's development impact. Coincidentally, several underdeveloped countries have unfavourable investment climate and weak institutions, while advanced ones have strong institutions and favourable investment climate. However, economic development factors are not straightforward and very dynamic nature. Given this development conundrum, it is imperative to investigate the moderating role of institutions and investment on industrialisation's economic development impact.

We assume that investment climate and institutional quality leverage or moderate industrialisation's impact on economic development among 26 African and 26 Asian countries from 1995 to 2018. We investigate this by making the following hypotheses.

1. Industrialisation, institutional quality and favourable investment climate positively affect economic development.
2. Industrialisation's economic development impact is enhanced by better institutions and favourable investment climate.

The thesis proposes development practitioners and policymakers to consider and promote investment policies and institutional developments to enhance industrialisation and economic development. Findings generally confirm the short- and long-run importance of investment climate, institutions and industrialisation on economic development. We apply dynamic panel data framework to account for certain aspects of cross-sectional and intertemporal characteristics of various observed economic development processes, such as manufacturing employment level, profile of investment and institutions.

To get an appreciation of how today's advanced economies successfully transformed their economies through industrialisation, it is imperative to examine the linkages or relationships of economic development, industrialisation and institutional quality, as well as how institutions are linked to other variables. Beyond focusing only on how institutions relate with economic development, we disaggregate the analysis to make it stronger when analysing today's developed countries' industrialisation process particularly of their manufacturing sector. Separating the role of industrialisation from other factors that affect economic development allows us to understand certain institutions that are key in promoting industrialisation despite that industrialisation is an engine of economic development (Chang & Andreoni, 2019).

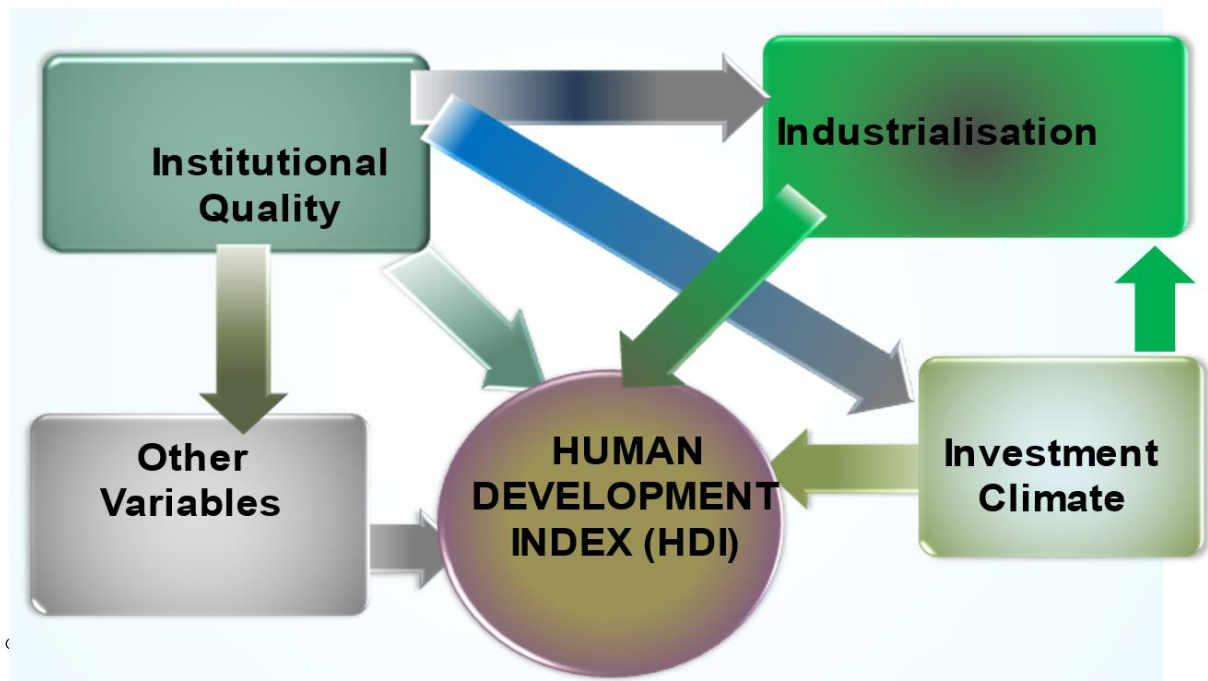
The centrality of institutions to economic development has a long history in the field of economics (Acemoglu et al., 2001; Kraay et al., 1999; La Porta et al., 1997; World Bank, 2003, 2017). Nevertheless, economic development and institutions relationship is not always linear and uniform for every country as suggested by neoclassical economists, that is optimum institutional quality maybe good for developed countries but can be harmful to developing countries (Chang & Andreoni, 2019).

Abramovitz (1995) through his social capabilities' ideology identifies certain type of institutions that were cardinal to industrial development and structural transformation of today's advanced economies. Institutional arrangements are vital in triggering structural transformation as they influence policy design, enforcement and implementation (Chang & Andreoni, 2019). "The development process should link micro learning dynamics, economy-wide accumulation of technological capabilities and industrial development," (Cimoli et al., 2009). "The development process entails a process of production transformation, led by the expansion of collective capabilities and resulting in the creation of good quality jobs and sustainable structural change," (Andreoni & Chang, 2017, p. 173). The two definitions of development emphasise the centrality of institutional quality in industrialisation and development. Based on structural views on the relationship of economic development, industrialisation and institutional quality and recent research by Chang and Andreoni (2019) we develop a framework that explains how institutional quality affects industrialisation, economic development, investment climate and other variables determining economic development.

Using a neoclassical growth model, this chapter formalises and contextualises an alternative channel through which institutional quality affects economic development, industrialisation, investment and other determinants of economic development. Following Dawson (1998), our framework additionally explains how institutional quality indirectly affects economic development through investment. It also, explains the linkage of investment climate, industrialisation and economic development. Institutions and investment are linked through investment channel. According to Besley (1995), there are three explanations through which institutions positively influence investment. Firstly, strong institutions, particularly secure property rights protect investment proceeds from expropriation. Individuals do not undertake investments if they know that the sweat of their labour will be expropriated by someone. Secondly, strong institutions eliminate barriers to contractual and financial agreements that are key for investment decisions through governing financial markets and enforcing contracts. Thirdly, improved institutional quality enhance economic transactions between agents thereby encouraging investment.

A summary relating industrialisation, institutions, investment climate and economic development plus other determinants of economic development is shown in Figure 4.1. The framework provides new insights explaining the institutional quality-economic development relationship. Also, not all institutions are good for economic and industrial development and for every country. Existing literature has some gaps; thus, this framework explains the moderating role of institutions and investment climate on industrialisation's economic development impact. Nevertheless, knowing and understanding the institutions that matter for economic development, industrialisation and investment, and the extent of their impact for which level of development are imperative for making informed decisions and policymaking process.

Figure 4.1: Channels of Economic Development



Source: Computed by author.

4.2 ECONOMETRICS STRATEGY AND ESTIMATION ISSUES

Panel data consists of repeated observations from same individuals⁵⁴ over time (Arellano, 2003; Baltagi, 2005; Wooldridge, 2002). It captures dynamics of changes and fixed or stochastic effects of explanatory variables in a model in a better way. Panel data provides a profound understanding of dynamic adjustments between economic relationships (Baltagi, 2005). Examining dynamic relationships of variables while controlling for unobserved individual heterogeneity is possible with panel data but not with single cross-sectional data (Wooldridge, 2002). Because past developments (economic) contribute to current or future economic development, we include lags to capture this dynamic. Panel data accommodates lagged-dependent variables (LDVs) as regressors, which is impossible with single cross-sectional data (Cameron & Trivedi, 2005). Applying ordinary least squares (OLS) in a model with LDV results in biased but consistent estimates (Davidson & MacKinnon, 1993). Moreover, panel data has many advantages such as, provides more information, degrees of freedom, efficiency and variability in terms of data and less collinearity among variables; better for studying dynamics of adjustments and identifying

⁵⁴ These individuals can either be countries, regions, cities, industries, sectors, firms, workers or households.

and measuring effects that cannot be detected when using purely cross-section or time-series data; allows running tests for more advanced behavioural models (Baltagi, 2005).

Nevertheless, panel data does not solve all the problems that cross-section and time-series data cannot handle. It can lead to include false conclusions or misleading inferences due to cross-section dependence⁵⁵, especially for macro panel with long time series and problems associated with data collection and design, measurement errors and selectivity particularly in micro panel data (Baltagi, 2005). Moreover, applying dynamic panel dataset can result in biased estimates due to problems of various endogeneity sources such as measurement errors, variable omissions and simultaneous causality and unobserved heterogeneity among individuals (Wooldridge, 2002). Using OLS on panel data without considering, controlling for and correcting endogeneity can lead to biased, inconsistent, incorrect and inefficient results, thus posing serious problems that can lead to inappropriate interpretations about theory and misleading conclusions and inferences about cause and effect relating variables (Ullah et al., 2018; Zaefarian et al., 2017). Endogeneity makes the usual OLS parameters invalid, spurious and unreliable (Wooldridge, 2002, 2010).

Fixed effects model (FEM) is one way to solve endogeneity-related problems from sources such as unobserved individual heterogeneity and omitted variables. FEM uses first differencing of individual mean. Suppose we have an econometric model with just two explanatory variables, $\mathbf{X}$ and an LDV ($\mathbf{y}_{i,t-1}$) of the dependent variable $\mathbf{y}$:

$$\mathbf{y}_{it} = \beta_1 + \beta_2 \mathbf{y}_{i,t-1} + \mathbf{X}_{it} \beta_3 + \mu_i + \varepsilon_{it} \quad (1),$$

where β is parameter to be estimated, i is number of entities or individuals, μ is individual effect and ε is error term. Using OLS for equation (1) makes the parameters inconsistent and inefficient because by definition the dependent variable ($\mathbf{y}_{it}$) is a function of the individual term (μ_i) hence it automatically follows that the LDV ($\mathbf{y}_{i,t-1}$) is similarly a function of that individual term. We correct this by doing first-difference transformation to wipe out or get rid of individual effect (μ_i) and constant term in equation (1). The new equation is as follows:

$$\Delta \mathbf{y}_{it} = \beta_2 \Delta \mathbf{y}_{i,t-1} + \Delta \mathbf{X}_{it} \beta_3 + \Delta \varepsilon_{it} \quad (2).$$

⁵⁵This is a problem in cases where units that belong to the same cross-section are highly correlated to each other.

Even after first-difference transformation, $\Delta y_{i,t-1}$ - differenced LDV, is still correlated with $\Delta \varepsilon_{it}$ - disturbance process from their differences (Baltagi, 2005; Baum, 2013). Some studies note that taking deviations from individual means causes inconsistent estimates due to correlation still existing between the LDV and mean of disturbance or error term (Ahn & Schmidt, 1995; Anderson & Hsiao, 1981; Arellano & Bover, 1995; Holtz-Eakin et al., 1988). Subtracting the dependent variable's mean value and that of each regressor from respective variable for every individual makes the regressor and error term correlated (Nickell, 1981). The presence of LDV means violating strict exogeneity assumption in explanatory variables, thus making estimators under maximum-likelihood inconsistent (Hsiao, 2003).

Instrumental variable (IV), which uses first differencing equation (1) by first removing individual effects followed by using the dependent variable's second lag [$(y_{i,t-2})$ or $\Delta y_{i,t-2} = (y_{i,t-2} - y_{i,t-3})$] as instrument for the LDV, or $\Delta y_{i,t-1} = (y_{i,t-1} - y_{i,t-2})$ can be used (Anderson & Hsiao, 1981). If the time-variant individual effects (ε_{it}) are not serially correlated the instruments are also uncorrelated with differenced time-variant individual effects ($\Delta \varepsilon_{it} = \varepsilon_{it} - \varepsilon_{i,t-1}$). Since IV does not exploit all moment conditions its estimators are consistent but inefficient (Ahn & Schmidt, 1995) and it disregards the differenced structure on $\Delta \varepsilon_{it}$. Also, instruments in levels ($y_{i,t-2}$) are better than those from difference ($\Delta y_{i,t-2}$) because they have smaller variances than those from difference (Arellano, 1989). Anderson-Hsiao estimator uses instruments in levels, which yields consistent estimates (Anderson & Hsiao, 1982) nevertheless, it does not use all potential instruments or orthogonal conditions (Arellano & Bond, 1991), thus they recommend generalised method of moments (GMM). Compared to Anderson-Hsiao estimator, it yields more efficient estimates by using both internally generated and external instruments from the LDV and disturbances as additional instruments. However, these instruments are different from the usual IV instruments because finding a valid instrument(s) under IV can be a challenging task. Thus, a good instrument should satisfy two properties namely; consistency and efficiency, that is, it should be uncorrelated with error term(s) and should be highly correlated with regressors it is being instrumented (Cameron & Trivedi, 2005, p. 908).

With GMM, having prior knowledge about the distributions of time-invariant individual fixed effects and the error term is not a prerequisite (Baltagi, 2005, p. 138). Thus, it is more

appropriate for dynamic panel datasets with LDV because it has power to control endogeneity, errors from measurement, bias from omitted variables and unobserved panel heterogeneity (Roodman, 2009a). According to Baum (2013, p. 10) and Roodman (2009a, p. 86) GMM estimation is suitable under the following conditions. First, the nature of dataset should be dynamic with the response variable explained by its own past realisation(s) and other regressors. Second, N (number of entities) is strictly above or equal to T (time dimension). Third, the functional relationship between the dependent and explanatory variables should be linear. Fourth, the regressors should not be strictly exogenous, that is, endogeneity should exist. Fifth, the model should have fixed individual effects, and finally, there should be autocorrelation and heteroscedasticity within panels or groups but not across them. Nevertheless, the problem of weak instruments can affect GMM particularly under circumstances where the coefficient of the lagged dependant variable (autoregressive parameter) approaches one or when variance of the unobserved unit-specific effects becomes large (Binder et al., 2005; Bun & Windmeijer, 2010). Likewise, the sample size can rapidly become smaller than the number of instruments, thus making coefficient and standard error estimates biased (Roodman, 2009b).

Generally, too many instruments cause instrument proliferation, “when all the lags of the endogenous explanatory variables are exploited,” (Bontempi & Mammi, 2015, p. 1075). Yet, more instruments dramatically improve efficiency (Dagenais & Dagenais, 1997). However, more moment conditions or instruments cause bias because overfitting is quite serious under increasing instruments, thus causing a large trade-off between efficiency and bias (Bekker, 1994; Newey & Smith, 2004; Ziliak, 1997). Many instruments also cause model overfit and overidentification, meaning a weak Hansen test hence cause incorrect model specification (Kripfganz, 2019; Roodman, 2009a, 2009b). These weaken instruments, thus cause poor performance. Weak instrumentation is circumvented by limiting lags to between 2 and 5 (Henningsen & Henningsen, 2019, p. 389). Level GMM estimation can address this problem (Arellano & Bover, 1995). Collapsing (Roodman, 2009a, 2009b) and curtailing (Bun & Kiviet, 2006) or a combination of both (Kiviet, 2020) can overcome instrument proliferation problem. Collapsing involves using standard instruments not “GMM-type” while curtailing involves using just a restricted number of lags as instruments (Kripfganz, 2019). With Roodman (2009a)’s *xtabond2* Stata command internal

instruments fall under the *gmmstyle()* command while external ones fall under the *ivstyle()* command. The instruments should always not exceed number of entities.

Popular GMM approaches are difference GMM (Arellano & Bond, 1991) and system GMM (Arellano & Bover, 1995; Blundell & Bond, 1998). Both use IV estimation, and instruments, which are internally and externally generated. Difference GMM transforms all regressors through differencing to rectify endogeneity problem. Difference GMM makes it impossible to estimate coefficients of time-invariant variables because these are automatically eliminated when doing transformation by taking differences. System GMM combines equations in level GMM and difference GMM (Blundell & Bond, 1998). This entails additional assumptions for system GMM. These extra assumptions mean imposing stricter or more serious orthogonal conditions. Including instruments from lagged variables, correlation between instruments and weak endogenous variables for large periods limit difference GMM, thus system GMM augments to correct endogeneity problem by using more instruments generated from both original and transformed equations (Roodman, 2009a, pp. 86-87). With extra instruments, system GMM outperforms difference GMM for small sample data and it results in dramatic efficiency gains and precision of parameter estimates (Bond, 2002) plus reduced finite sample bias (Baltagi, 2005, p. 148).

Using a simple model with single independent variable (LDV) below is a detailed derivation of GMM. $y_{it} = \theta y_{i,t-1} + \mu_i + v_{it}$ (3),

where i, t and θ are individuals, time period and parameter respectively. First, μ_i and v_{it} are independently related. Furthermore, for θ to be consistent as individuals increase or approach infinity with fixed time, we difference equation (3) to wipe out individual effects (μ_i) as below:

$$y_{it} - y_{i,t-1} = \theta(y_{i,t-1} - y_{i,t-2}) + (v_{it} - v_{i,t-1}) \quad (4).$$

For clarification purposes $(v_{it} - v_{i,t-1})$ is a moving average with unit root 1. Assuming that $t = 3$, it follows that equation (4) reduces to: $y_{i3} - y_{i2} = \theta(y_{i2} - y_{i1}) + (v_{i3} - v_{i2})$, and it follows that y_{i1} is a valid instrument because it is uncorrelated with $v_{i3} - v_{i2}$ but strongly correlated with $(y_{i2} - y_{i1})$. If t is equal to 4, both y_{i1} and y_{i2} are valid instruments because they are uncorrelated with $(v_{i4} - v_{i3})$ and strongly correlated with $(y_{i3} - y_{i2})$. The pattern

goes on like that and for higher values of t , and for every forward period an additional instrument is added. The series for valid instruments for period T become $(y_{i1}, y_{i2}, y_{i3}, \dots, y_{iT-2})$ (Baltagi, 2005, p. 137). However, with IV procedure the differenced error in equation (4) is still unaccounted for.

Forward-filtering procedure enhances efficiency gain since it removes serial correlation associated with time-varying error component (Keane & Runkle, 1992). Moreover, least-squares dummy variable estimation can lead to more efficient results than other IV estimations and probably difference GMM because of its relatively smaller dispersion than other estimators (Kiviet, 1995, p. 55). Also, Ahn and Schmidt (1995) derive extra non-linear moment restrictions that IV estimators by Anderson and Hsiao (1981) (Anderson-Hsiao estimator), Holtz-Eakin et al. (1988), and Arellano and Bond (1991) (difference GMM) fail to fully exploit under usual assumptions for dynamic panel dataset.

Nevertheless, exploiting the initial condition becomes relevant when generating estimators for small T (Blundell & Bond, 1998). IV estimator, first-difference GMM (one-step GMM) lead to biased and less precise results (ibid). Two-step difference GMM (second order transformation) corrects poor performance due to weak instrumentation (Arellano & Bover, 1995). Level GMM works better when individual unobserved effects are uncorrelated with instruments. Unlike in the first-order transformation where the transformation takes away the variable's previous observations from its current value, the second order transformation instead takes away the variable's averages of its future possible available observations (Roodman, 2009a, p. 86).

4.3 MODEL DESCRIPTION AND DATA SOURCES

Studies analysing empirical economic development or growth and its determinants use Barro (1991)'s regression and the initial condition for output or growth level among determinants. However, Barro regression has problems among them; poor estimation of the model's functional form in economic theory, causality between growth and its factors, small size of observations, poor inference of estimates from reduced form relationships (Hauk & Wacziarg, 2009, p. 104). Evidence also demonstrates that economic development process is characterised by key non-linearities, for instance macroeconomic policies of every country's specific conditions which Barro (1991) and his followers fail to capture. Most empirical literature investigating economic

growth or development determinants normally use output level (income) per capita or income or its per capita growth rate as proxy for economic development. More income or output mostly mean high or expanded choices of consumption goods, but using them to measure economic development like most empirical literature does conceal other important aspects describing complete opportunities for individuals.

We follow Binder and Georgiadis (2010) and apply dynamic panel model. However, we did not compare GDP and HDI. We also go beyond income or output, which are traditionally used to measure economic development. We analyse how institutional quality and investment profile augment or complement the economic development impact of industrialisation from 1995 to 2018 in 26 African and 26 Asian economies. African countries include Algeria, Botswana, Cameroon, Congo, Democratic Republic Congo, Cote d'Ivoire, Egypt, Gabon, Gambia, Ghana, Malawi, Mali, Morocco, Mozambique, Namibia, Niger, Senegal, Sierra Leone, South Africa, Sudan, Tanzania Republic, Togo, Tunisia, Uganda, Zambia and Zimbabwe, and Asian economies are Armenia, Bangladesh, People's Republic of China, Hong Kong, India, Indonesia, Iran, Israel, Japan, Jordan, Korea Republic, Kuwait, Malaysia, Mongolia, Pakistan, Philippines, Qatar, Russia Federation, Saudi Arabia, Singapore, Sri Lanka, Taiwan, Thailand, Turkey, United Arab Emirates and Vietnam. Sample size and time dimension are based on data availability.

There are important assumptions to help us effectively analyse our hypotheses. Past values of explanatory terms are assumed to have no effect on dependent variable. Nevertheless, past values of response variable affect dependent variable; and explanatory terms' future values and error term are correlated. Also, the model captures development effects arising from policy changes that vary across countries, different institutions and development stages, and other key economic characteristics. Our model's independent variables reflect various government policies that enhance or should promote human development. We included multiplicative interaction terms involving industrialisation, investment and institutions. Including the highest interaction term means including all other partial interactions (Cohen et al., 2003, p. 284). Not including them can make main effects and effects associated with interaction terms to be confounded. Industrialisation is the main independent variable or focal predictor while investment and institutional quality are moderators. The model is as follows:

$$\begin{aligned}
\ln HD_{it} = & \beta_0 + \beta_1 \ln HD_{lagit} + \beta_2 \ln GDP_{it} + \beta_3 \ln FGC_{it} + \beta_4 \ln CF_{it} + \beta_5 HC_{it} + \\
& \beta_6 GI_{it} + \beta_7 INF_{it} + \beta_8 INV_{it} + \beta_9 IND_{it} + \beta_{10} INST_{it} + \beta_{11} IND_INV_{it} + \\
& \beta_{12} IND_INST_{it} + \beta_{13} INV_INST_{it} + \beta_{14} IND_INV_INST_{it} + \varepsilon_{it} + \mu_i
\end{aligned} \tag{5}$$

We factorise industrialisation and get the following;

$$\begin{aligned}
\ln HD_{it} = & \beta_0 + \beta_1 \ln HD_{lagit} + \beta_2 \ln GDP_{it} + \beta_3 \ln FGC_{it} + \beta_4 \ln CF_{it} + \beta_5 HC_{it} + \\
& \beta_6 GI_{it} + \beta_7 INF_{it} + \beta_8 INV_{it} + \beta_{10} IST_{it} + \beta_{13} INV_IST_{it} + (\beta_9 + \beta_{11} INV + \\
& \beta_{12} IST + \beta_{14} INV_IST) IND_{it} + \varepsilon_{it} + \mu_i
\end{aligned} \tag{6}$$

Furthermore, we present variables and their data sources.

Table 4.1: Variable Description and Data Sources

Variable	Description	Sign	Data sources
<i>lnHD</i>	Human development index.		UNDP (2019) except for Taiwan Smits and Permanyer (2019).
<i>lnHD_{lag}</i>	lag of HD.	+(−)	
<i>lnGDP</i>	Per capita GDP at constant 2017 purchasing power parity.	+	Feenstra et al. (2015).
<i>lnFGC</i>	Per capita general final government consumption in current US\$ in logarithm.	−	WDI and UNCTAD.
<i>lnCF</i>	Per capita gross fixed capital formation in current US\$.	+	WDI and UNCTAD.
<i>HC</i>	Human capital.	+	Feenstra et al. (2015).
<i>GI</i>	Gender inequality index	−	UNDP and IMF.
<i>INF</i>	Inflation.	−	WDI and UNCTAD.
<i>INV</i>	Investment profile.	+	Political Risk Service Group.
<i>IND</i>	Industrialisation.	+	WDI and UNCTAD.

<i>IST</i>	Institutions.	+	Political Risk Service Group
<i>IND_INV</i>	Industrialisation X investment.	+(-)	
<i>IND_IST</i>	Industrialisation X institutions.	+(-)	
<i>INV_IST</i>	Investment X institutions.	+(-)	
<i>IND_INV_IST</i>	Industrialisation X investment X institution.	+	
<i>ln, i, t</i>	Natural logarithm, country and years respectively.		
<i>β, ε, μ</i>	Parameters, error term & individual effects respectively.		

Note: Taiwan's data for other variables is other sources⁵⁶.

HD - values fall within 0 and 1, with 0 and 1 reflecting low and highest performance. Its values fall into four classes namely; low HDI (0 to 0.550), medium HDI (0.550 to 0.699), high HDI (0.700 to 0.799) and very high HDI (0.800 to 1) (UNDP, 2016). The lagged variable captures growth convergence effect (Barro, 1991; Barro & Sala-i-Martin, 2004). **GDP** - in purchasing power parity accounts for inflation rates and differences in living costs and standards between countries. It is a component of HDI.

FGC - covers all current expenditures (goods and services) by government, and reflects government consumption fiscal policy related aspects. **CF** - measures investment, and reflects fiscal policy and other policies that stimulate investment and savings by both public and private

⁵⁶<https://ws.ndc.gov.tw/Download.ashx?u=LzAwMS9hZG1pbmlzdHJhdG9yLzExL3JlbGZpbGUvNTgxNy8zMjg0Mi9lMG15MDNmOC02MDliLTQ4ODAtOTAxNy0yN2JmYzg4M2QyYWQucGRm&n=VGFPd2FuIFN0YXRpc3RpY2FsIERhdGEgQm9vayAyMDE5LnBkZg%3D%3D&icon=..pdf>
<https://eng.stat.gov.tw/>
<https://eng.stat.gov.tw/ct.asp?xItem=25280&ctNode=6032&mp=5>
<https://ws.ndc.gov.tw/Download.ashx?u=LzAwMS9hZG1pbmlzdHJhdG9yLzExL3JlbGZpbGUvNTgxNy8zMjg0Mi9lMG15MDNmOC02MDliLTQ4ODAtOTAxNy0yN2JmYzg4M2QyYWQucGRm&n=VGFPd2FuIFN0YXRpc3RpY2FsIERhdGEgQm9vayAyMDE5LnBkZg%3D%3D&icon=..pdf>

sector. **HC** - measures quality and improvements in labour force. **INV** - measures investment climate. It assesses factors that affect the risk to investment that are not covered by political, economic and financial components (Howell, 2013). A favourable investment environment promotes economic growth, job creation and technology spillovers, hence increases industrialisation, structural transformation and development. However, these depend on government policies. **INF** - indicates consumer price-based inflation. Unlike GDP deflator-based inflation, which is more comprehensive consumer price index-based inflation is limited to a fixed basket of commodities. Excessively high inflation affects economic development by eroding purchasing power.

GI - measures disadvantages or unequal empowerment, health and labour market opportunities between male and female (UNDP, 2020). It also includes maternity mortality ratio, adolescent fertility rate, secondary and tertiary educational attainment, number of seats that female parliamentarians occupy and labour market participation⁵⁷. Development literature emphasises, development is incomplete and exclusive when it leaves behind other people. Gender inequality constrains economic growth, and manifests itself in low human development. Women and youth participation in economic and political activities is important because they are agents of change in society (Anand & Sen, 1995; UNDP, 1995). Unequal access and opportunities to capital, education, economic, employment and other resources between women and men in society create human development gaps. Gender inequality is among major impediments to human development in developing countries. According to UNDP (2018, p. 4), inequality begets inequality, thus causes institutional and policy deficiencies and social unrest, which impact human progress.

IND - indicates percentage component of employment in industry to total employment. Compared to value added, employment directly translates to more jobs and improved living standards and economic development while the impact of value added depends on policies. **IST** - measures the average of corruption and government stability. Corruption index and government stability values are from 0 to 6 and 0 to 12 respectively. Government stability indicates government's ability to stay in office and implement intended programs, and corruption index

⁵⁷ <https://data.imf.org/api/document/download?key=61312770>

measures corruption within the political system (Howell, 2013). We half government stability to bring it to the same measurement level with corruption, and then calculate the average.

IND_INV, ***IND_IST***, ***INV_IST*** and ***IND_INV_IST*** - are multiplicative interaction terms. Including the interaction terms means the impact of industrialisation on economic development is no longer explained in simple average, but depends on moderators (investment and institutions). Not including interaction terms can result in false conclusions, incomplete and misleading main effects (Baltagi, 2005; Baum, 2006). However, the highest interaction term should be statistically significant (Baltagi, 2005; Baum, 2006; Cameron & Trivedi, 2010).

Prior to any estimations, we test cross-sectional dependence. If cross-sectional dependence exists, further statistical diagnostics or use other approaches that control are to be performed (Tugcu, 2018). Cross-sectional dependence can result from, *“presence of common shocks and unobserved components that ultimately become part of the error term, spatial dependence, and idiosyncratic pairwise dependence in disturbances with no particular pattern of common components or spatial dependence,”* (De Hoyos & Sarafidis, 2006, p. 482). Sarafidis and Robertson (2009) argue that cross-sectional dependence is severe in large N and small T samples. However, our dataset has small T and N, thus cross-sectional dependence is not any issue. Pesaran’s CD test (Pesaran, 2004), Frees’ test (Frees, 1995) and Friedman’s test (Friedman, 1937) are widely used tests (De Hoyos & Sarafidis, 2006; Tugcu, 2018). Using the Pesaran’s CD test, we reject that cross-sectional dependence exists. However, just relying on this test (Pesaran’s CD) provides insufficient justification to approve or disapprove the results, thus we further perform Frees’ test and Friedman’s test. What is more, all the three tests converge.

If we are not concerned about the dynamic nature of our data, we can just run OLS regression, which is traditionally and widely used to analyse and estimate relationships among variables. However, it does not account for individual-level unobserved heterogeneity. We can correct this by adding cluster-robust VCE option to OLS model, which accounts for possible correlations between individuals’ errors over a given time. Nevertheless, Baum (2013) stresses that doing this fails to solve possible impact of unobserved individual heterogeneity on the conditional mean. To circumvent this problem, we then run FEM. However, time-invariant differences’ effects on dependent variable are not analysable with FEM because these do not

change over time (Kohler & Kreuter, 2012). What is more, for small T, FEM estimates can still suffer from the Nickell bias. Due to concerns over possible reverse causality or endogeneity concerns⁵⁸ between institutions and growth or development, we apply GMM approach because it circumvents these problems. GMM results are deemed more efficient and consistent than OLS, FEM or two-stage least squares results. Two-stage can also handle endogeneity, but reweighting of second moment conditions can result in biasedness (Roodman, 2009a, p. 95).

4.4 RESULTS PRESENTATION AND DISCUSSION

This section presents both short- and long-run relationship results of economic development and its determinants. Industrialisation, investment profile and institutional quality are variables of interest while GDP per capita, government consumption, capital formation, human capital, gender inequality and inflation are control variables. Institutional quality and investment profile moderate industrialisation's impact on economic development for 26 African economies and 26 Asian economies. We present the results for each economic grouping. We start with descriptive statistics.

Table 4.2: Summary Statistics, African Countries 1995-2018

Variable	Observations	Mean	Std. Dev	Min	Max
HD	624	0.4972853	0.1209646	0.23	0.759
GDP	624	4747.509	4323.501	469.19	19465.25
FGC	624	288.8688	372.1097	5.836779	1590.464
CF	624	433.8171	570.713	2.910371	3449.372
HC	624	1.820041	0.4370109	1.08703	2.911752
GI	624	0.5912129	0.1015884	0.1474002	0.8280454
INF	624	16.59615	111.8055	-72.72938	618.75
IND	624	14.24856	7.715945	1.835	33.728
INV	624	7.268623	1.930507	0	11.5
IST	624	6.416363	1.190959	2.5	9.270833

Source: Author's Own Calculation.

⁵⁸ See more details in Acemoglu et al. (2001); Beverelli et al. (2018); Constantine (2017); Dollar and Kraay (2003); Hall and Jones (1999) and Rodrik et al. (2004).

Table 4.3: Summary Statistics, Asian Countries 1995-2018

Variable	Observations	Mean	Std. Dev	Min	Max
HD	624	0.7298606	0.1162551	0.427	0.939
GDP	624	26053.61	25422.86	1696.57	105109
FGC	624	2080.459	2583.941	15.25196	12970.5
CF	624	3520.151	4755.554	62.98521	32990.5
HC	624	2.605376	0.5345685	1.449728	4.154454
GI	624	0.3776892	0.1804228	0.0037695	0.7770758
INF	624	7.521559	14.57283	-4.87013	197.2262
IND	624	24.05533	7.309575	9.778	59.576
INV	624	8.339035	2.034112	2.416667	12
IST	624	6.92203	1.230113	3.5	10

Source: Author's Own Calculation.

Compared to Asian economies, Africa has the lowest mean, minimum and maximum on all the variables except gender inequality (see Table 4.2 and 4.3). The average HDI of Africa is 0.497 (low category), while Asia's is 0.730 (high category). African countries with lowest HDI are Mali, Mozambique, Niger and Sierra Leone while Asian countries include Bangladesh, India and Pakistan. No African country falls in high category, yet Asia has over 30% of its observations with high HDI.

We test the number of lags of dependent variable (HDI) that capture most relevant information about its current levels. Disregarding this information causes equation misspecification. We run OLS to determine significant lags of dependent variable (Wintoki et al., 2012). We drop significant lags and run another OLS to determine the other significant lags. These new significant lags are valid internal instruments for GMM estimation. Tests reveal that lag 5 is appropriate for generating internal instruments for HDI. We then run POLS and FEM estimations as baseline models. To show how endogeneity affects parameter estimates, we compare POLS and FEM results with GMM results. These are short-run coefficients. Nevertheless, our discussion centres only around GMM results. The coefficient of LDV is statistically significant suggesting that initial level of HDI affects current HDI. Table 4.4 and 4.5 present full regression results.

Table 4.4: Regression Results, African Countries 1995-2018

VARIABLES	POLS	FEM	SYS-GMM
lag_lnHD	0.950*** (0.0136)	0.839*** (0.0164)	0.675*** (0.0615)
lnGDP	-0.00224 (0.00249)	0.00568 (0.00636)	0.0311*** (0.00944)
lnFGC	-0.00404** (0.00173)	0.00287 (0.00214)	-0.0162** (0.00785)
lnCF	0.00880*** (0.00155)	0.00763*** (0.00134)	0.0212*** (0.00401)
HC	0.00249 (0.00273)	-0.0211** (0.00823)	0.0461*** (0.0140)
GI	-0.0185 (0.0139)	0.00512 (0.0229)	-0.118* (0.0583)
INF	-4.51e-05*** (6.50e-06)	-4.00e-05*** (8.77e-06)	-6.41e-05** (2.79e-05)
IND	0.000262 (0.00252)	-0.00417 (0.00269)	0.0144 (0.0129)
INV	-0.00398 (0.00539)	-0.00574 (0.00526)	0.0223 (0.0244)
IST	-0.00147 (0.00595)	-0.00871 (0.00546)	0.0216 (0.0264)
IND_INV	8.77e-05 (0.000336)	0.000212 (0.000340)	-0.00172 (0.00172)
IND_IST	-0.000120 (0.000390)	0.000442 (0.000357)	-0.00159 (0.00187)
INV_IST	0.000409 (0.000860)	0.000814 (0.000749)	-0.00297 (0.00373)
IND_INV_IST	4.82e-08 (5.16e-05)	-3.32e-05 (4.69e-05)	0.000218 (0.000250)
YEAR	YES	YES	YES
Constant	YES	YES	YES
Observations	598	598	598
R-squared	0.998	0.992	
Number of PID		26	26
Number of Instruments			26
AR(1)			0.018
AR(2)			0.861
Hansen OIR Test			0.182
Hansen test of Exogeneity			0.135

Robust standard errors in parentheses

* = p<0.1, ** = p<0.05, *** = p<0.01

Source: Author's Own Calculation.

Table 4.5: Regression Results, Asian Countries 1995-2018

VARIABLES	POLS	FEM	SYS-GMM
lag_lnHD	0.972*** (0.0101)	0.970*** (0.0138)	0.782*** (0.0783)
lnGDP	-9.79e-05 (0.00164)	-0.00456 (0.00273)	0.0471** (0.0201)
lnFGC	-0.00182* (0.00101)	-0.00145 (0.00233)	-0.0422** (0.0164)
lnCF	0.00302*** (0.000784)	0.00409** (0.00179)	0.0280** (0.0104)
HC	0.000366 (0.00153)	-0.00198 (0.00215)	0.0312*** (0.0108)
GI	-0.00264 (0.00448)	0.00723* (0.00363)	-0.00753 (0.0252)
INF	2.70e-05 (2.80e-05)	-5.19e-05** (2.40e-05)	-0.000287** (0.000124)
IND	-0.000171 (0.000957)	-0.000203 (0.00104)	0.0160** (0.00582)
INV	-0.00267 (0.00298)	-0.00394 (0.00355)	0.0476** (0.0213)
IST	-7.80e-05 (0.00294)	-0.00321 (0.00364)	0.0534** (0.0228)
IND_INV	9.44e-05 (0.000121)	8.77e-05 (0.000124)	-0.00163** (0.000695)
IND_IST	9.36e-06 (0.000120)	4.48e-05 (0.000123)	-0.00193** (0.000766)
INV_IST	0.000316 (0.000374)	0.000644 (0.000444)	-0.00579* (0.00284)
IND_INV_IST	-1.21e-05 (1.54e-05)	-1.51e-05 (1.57e-05)	0.000191** (8.86e-05)
Constant	YES	YES	YES
Observations	598	598	598
R-squared	0.999	0.994	
Number of PID		26	26
Number of Instruments			26
AR(1)			0.006
AR(2)			0.652
Hansen OIR Test			0.109
Hansen test of Exogeneity			0.077

Robust standard errors in parentheses

* = p<0.1, ** = p<0.05, *** = p<0.01

Source: Author's Own Calculation.

All variables have expected signs. Except gender inequality, all variables on Asian economies are statistically significant, but only GDP per capita, general government consumption, capital formation, human capital, gender inequality and inflation are significant for African economies. Government consumption's impact on economic development or growth is generally positive as postulated by the law of Wagner (1958) that government spending is income or growth elastic. However, in our case it is negative and statistically significant in line with Barro and Sala-i-Martin (2004) and Landau (1986). Binder and Georgiadis (2011) also find its impact on growth and HDI negative and positive respectively though insignificant. Institutions and investment climate are statistically significant only for Asian economies. Institutions can incentivise or penalise economic agents to behave in a certain way. They can inspire agents to undertake productive activities for instance development of new production techniques and new goods and new ideas or accumulation of skills. Nevertheless, they can promote predatory behaviours for instance corruption, rent-seeking and theft. These are like a tax on business and investment. Effective institutions mean that agents would not invest part of resources to mitigate diversion.

Presence of interaction terms involving industrialisation means its effect of HDI depends on these terms⁵⁹. However, the highest order interaction term (three-way continuous interaction) should be statistically significant, suggesting that the moderator variables (institutions and investment climate) jointly influence industrialisation's economic development impact. This condition is true only for Asian economies. There is evidence that improving investment climate and institutions increases the impact of industrialisation on HDI in Asian economies. However, the impact is not static but varies with values of investment and institutions. Only at zero values of investment profile and institutional quality is industrialisation's economic development impact explained as main effects.

We plot margins and observe how slopes change at given combinations of industrialisation, investment and institutions (see Table 4.6). The variables' lowest and highest values are used to calculate margins. Alternatively, we can use spot analysis to calculate the margins (Aiken et al., 1991). It entails using different sets of values (mean, one standard deviation

⁵⁹ See Stock and Watson (2015, p. 286) for details on how to calculate the slope in the presence of a multiplicative interaction term.

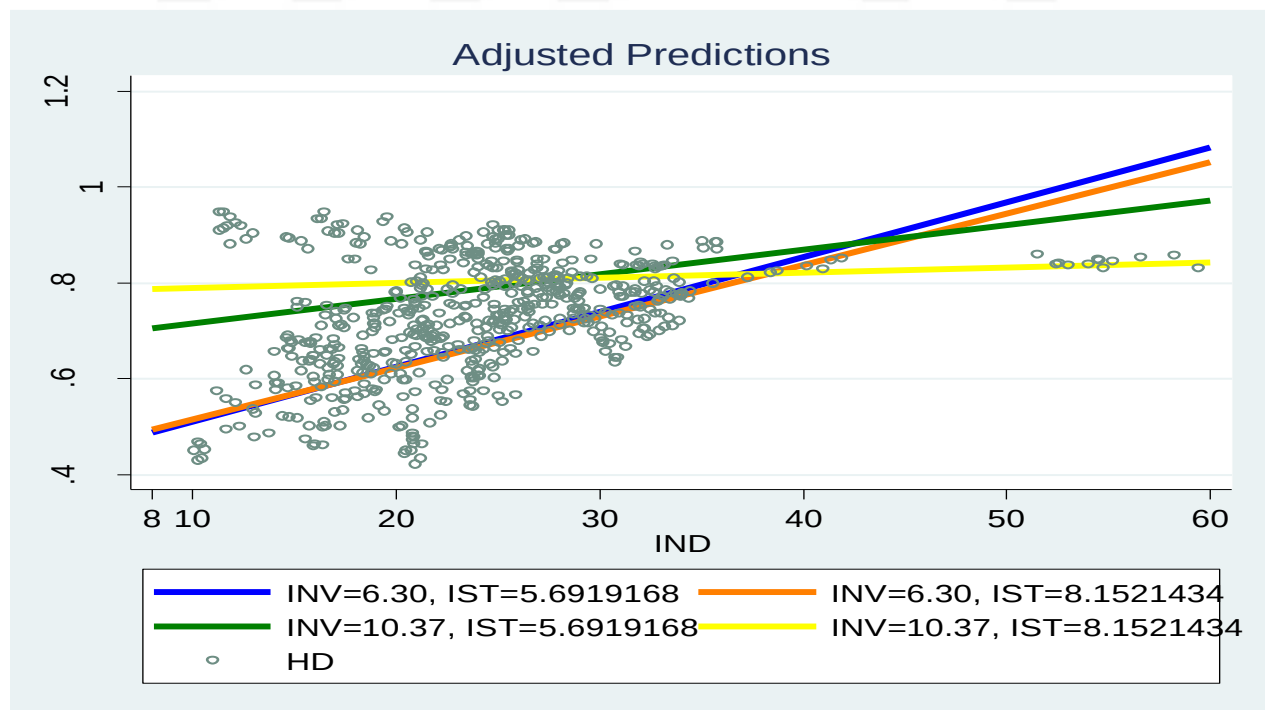
plus mean, and the mean less one standard deviation) of moderating variables to calculate the slope of main variable. We run OLS of the three variables and their interaction terms on HDI.

Table 4.6: HDI Predictive Margins from Industrialisation, Investment and Institutions

	<i>Delta-method</i>					
	Margin	Std. Error	t	P> t	[95% Conf. Interval]	
_at						
1	.7867492	.0098248	80.08	0.000	.767455	.8060434
2	.4929674	.017939	27.48	0.000	.4577384	.5281964
3	.7057588	.0196279	35.96	0.000	.6672131	.7443045
4	.486676	.0128332	37.92	0.000	.461474	.5118781
5	.8431294	.0194454	43.36	0.000	.8049421	.8813167
6	1.051679	.0361946	29.06	0.000	.9805992	1.122759
7	.9727224	.039994	24.32	0.000	.8941813	1.051263
8	1.083567	.0287485	37.69	0.000	1.02711	1.140024

Source: Author's Own Calculation.

Figure 4.2: Predictive Margins



Source: Author's Calculation from Regression

As Table 4.6 shows, all the margins are statistically significant, suggesting that both investment climate and institutions play a moderating role on industrialisation's economic development impact. However, there are combinations of industrialisation, investment climate and institutions with margins that appear to be similar. The margins at 1, 3 and 5 appear to be similar while those at 2 and 4 and 6, 7 and 8 also appear to be similar. We plot a diagram to see how these margins appear graphically (see Figure 4.2). Improvements in investment climate and institutional quality are key to industrialisation and economic development. That is, better investment climate and institutions stimulate industrialisation's economic development impact. However, not all the combinations have the same margins. Results are both statistically significant and practically meaningful because Asian economies generally have quality infrastructure and logistics, education systems, institutions and working economic linkages which create or facilitate efficient operation of other industries. They possess relevant technical and vocational training and education key for industrialisation and investment attraction, hence enable them to specialise in high-value-added, capital-intensive, high-productivity and high-technology industries.

No evidence of investment and institutions moderating industrialisation's economic development impact among African economies. Policies that worked elsewhere may not work in Africa because unlike other continents, Africa lacks world class infrastructure (dams, electricity, energy, roads and railway), development-oriented leadership and well-educated and trained workforce and population in scientific, innovation and technical fields. Furthermore, because of preindustrialisation deindustrialisation (Tregenna, 2015), African countries lack minimum institutional and investment thresholds to jumpstart industrial development. Likewise, industries in Africa are highly informal, and even the few formal ones are weakened by lack of economic clusters and linkages.

Furthermore, investment and institutions fail to stimulate the impact of industrialisation on economic development in Africa because of lack of vision, clarity and credibility and transparency in the policymaking process. Also, the working relationship between private sector and government is sometimes sour, and the government does not support the private sector yet it is the mainstay of industrial development and an attraction of FDI and technology. Similarly, meritocracy in public services does not exist and senior government officials lack an appreciation of the importance of research to make evidence-based policies to develop industries. Last but not

least, African governments should have long-term strategy for industrialisation rather than do trial and error in implementing policies that have failed somewhere.

Also, Africa's problems are worsened by Africans ourselves. We are not independent minded; we do not know what we want and we seem to lack the ability to think critically and have clear policy and vision. Africa has to study the development history of other continents and see how they grew, what challenges they faced and how did they overcome them. Precisely, before rushing into implementing certain policies African policymakers should understand which type of institutions and investments and what were the necessary conditions that made the industrialisation process possible in other developed regions. Moreover, the leadership in particular and population in general should get rid of greediness, corruption, saboteur and selling out for cheap material things. Since the three-way interaction term for African countries is insignificant, we drop insignificant interaction terms and run a new regression (see results in Table 4.7).

Table 4.7: Regression Results, African Countries 1995-2018

VARIABLES	POLS	FEM	SYS-GMM	SYS-GMM
lag_lnHD	0.946*** (0.0147)	0.849*** (0.0155)	0.697*** (0.106)	0.691*** (0.107)
lnGDP	-0.00189 (0.00271)	0.00338 (0.00873)	0.0302* (0.0156)	0.0309* (0.0160)
lnFGC	-0.00353* (0.00195)	0.00215 (0.00230)	-0.0152* (0.00853)	-0.0157* (0.00866)
lnCF	0.00843*** (0.00153)	0.00792*** (0.00129)	0.0194*** (0.00505)	0.0199*** (0.00515)
HC	0.00423 (0.00283)	-0.0233*** (0.00826)	0.0394** (0.0177)	0.0404** (0.0166)
GI	-0.0212 (0.0147)	0.0185 (0.0221)	-0.108* (0.0610)	-0.110* (0.0624)
INF	-3.61e-05*** (8.03e-06)	-2.98e-05*** (7.11e-06)	-6.90e-05** (2.49e-05)	-7.04e-05*** (2.46e-05)
IND	0.000148 (0.000161)	-0.00138*** (0.000434)	0.00178** (0.000802)	0.00183** (0.000841)
INV	-0.000244 (0.000423)	-0.000484 (0.000556)	8.68e-05 (0.00112)	
IST	-0.000207 (0.000728)	-0.000268 (0.000783)	-0.000244 (0.00208)	
YEAR	YES	YES	YES	YES
Constant	YES	YES	YES	YES
Observations	598	598	598	598

R-squared	0.998	0.991		
Number of PID		26	26	26
Number of Instruments			14	12
AR(1)			0.059	0.059
AR(2)			0.701	0.704
Hansen OIR Test			0.220	0.269
Hansen test of Exogeneity			0.305	0.227

Robust standard errors in parentheses

* = $p < 0.1$, ** = $p < 0.05$, *** = $p < 0.01$

Source: Author's Own Calculation.

All variables have anticipated signs except institutions. Besides investment and institutions, other variables are statistically significant. Industrialisation generally leads to high HDI. A percentage increase in industrialisation increases HDI by 0.16% in African countries. The results are statistically significant but practically insignificant because Africa's manufacturing sector generally comprises agro-processing, furniture and food and beverages, activities which are characterised by low-value-added, high labour-intensive, low-productivity and low-technology uptake. Industrialisation can have a more significant impact on development if African countries embrace technology and venture into capital-intensive manufacturing industries. African countries can stimulate development by addressing deficiencies in GDP growth, government investment, government spending, human capital, gender inequality, inflation and industrialisation. They should formulate policies that promote technology transfer, human capital development and gender equality, and strengthen institutions.

No evidence that improving investment climate and institutional quality increase HDI despite predictions by mainstream economics that the two variables contribute positively to development. Africa's level of development could be among the reasons why better institutions and investment climate are not statistically significant. What worked in other regions may not work for Africa because Africa countries generally lack developed infrastructure (electricity, dams, roads and railway), development-oriented leadership and human capital (well-educated and trained workforce and population in scientific and technical fields). African countries should address infrastructure rigidities, poor transportation, linkages and logistics, high corruption and rent-seeking behaviours and ineffective government policies. Nevertheless, rent-seeking behaviours can be avoided through effective rent management which ensures that resources meant for

supporting industrial policy are not diverted to enrich political elites or wasted to fund inefficient or poorly managed enterprises (Tregenna, 2015).

Also, mainstream institutional economic theories fail to recognise and explain that the relationship of institutional quality and economic development evolved through an inherent political nature and changing balances of power (Chang & Andreoni, 2019, p. 420). Furthermore, institutional quality can be affected by economic factors such as productive capabilities, production structure and technology. However, these are also affected by power relations and politics. Globally, FDI enables capabilities building and innovation accumulation, because domestic firms can learn from foreign firms. However, in Africa, agencies dealing with investment promotion and protection and other policies are generally weak and ineffective because of coordination failures within and between government departments, lack of referees and clearly defined investment rules and rampant corruption. Improving these elements could create an environment conducive for investment.

The coefficients of explanatory variables in Equation 5 are short-run coefficients which measure the immediate response of human development index to temporary shocks in the explanatory variables. The mathematical formular for long-run coefficients is $\frac{\beta_{1,2,3,\dots,14}}{(1-\beta_1)}$, that is, it is the short-run coefficient of each explanatory variable (from β_2 to β_{14}) divided by one minus the coefficient of the lagged dependent variable ($1 - \beta_1$). β_1 captures the persistence of the process (see Bruno et al. (2017, p. 13) for more explanation). However, only variables with statistically significant coefficients in the short-run are tested their significance in the long-run (see Table 4.8, where both short-run and long-run coefficients are presented).

Table 4.8: Short-run Versus Long-run Coefficients

	<i>Africa</i>		<i>Asia</i>	
	Long-run	Short-run	Long-run	Short-run
<i>lnGDP</i>	0.0996707***	0.0301727*	0.2164291***	0.0471022**
<i>lnFGC</i>	-0.0502966*	-0.015226*	-0.1938764 **	-0.042194**
<i>lnCF</i>	0.0670492***	0.0193559***	0.1286075*	0.0279893**
<i>HC</i>	0.3581211**	0.0393731**	0.1431872***	0.0311623***
<i>GI</i>	-0.3478523**	-0.1084117*		
<i>INF</i>	-0.0002281***	-0.000069**	-0.0013189**	-0.000287**
<i>IND</i>	0.0058896***	0.0017829**	0.0733881***	0.0159717**
<i>INV</i>			0.2185558***	0.047565**
<i>IST</i>			0.2453008***	0.0533856**
<i>IND_INV</i>			-0.007483***	-0.0016286**
<i>IND_IST</i>			-0.0088731***	-0.0019311**
<i>INV_IST</i>			-0.0266216**	-0.0057937*
<i>IND_INV_IST</i>			0.0008789**	0.0001913**

*** = $p < 0.01$, ** = $p < 0.05$, * = $p < 0.1$

Source: Author's Own Computation.

4.4.1 Robustness Check

We validate the results and model using pre- and post-estimation tests. We test relevance of interaction terms using Wald test (Cameron & Trivedi, 2010). A significant Wald test suggests that interaction term is relevant. Excluding significant interaction terms can result in misleading results (Baltagi, 2005; Baum, 2006). We further do mandatory GMM-related tests that enhance credibility and reliability of results and model. GMM's appropriateness depends on meeting three important diagnostic tests, which are serial correlation, endogeneity and exogeneity (Arellano & Bond, 1991; Eichenbaum et al., 1988; Li et al., 2021). The tests provide credibility and reliability to GMM estimation. We first test first-order (AR(1)) or second-order (AR(2)) serial correlation. The p-values of AR(1) and AR(2) should be significant and insignificant respectively. Next, we check instrument validity or over-identification test. The p-value of the Hansen test should be

insignificant. However, p-values greater than 0.10 and less than 0.25 are generally preferred (Roodman, 2009b). Researchers should treat values greater than 0.25 with caution. Lastly, we test exogeneity. The p-values of Hansen exogeneity test should be insignificant. Other tests are that the time dimension should be smaller than panel identities and instruments should not exceed entities.

4.5 CONCLUSION

We use System GMM to examine the moderating effect of investment climate and institutional quality on industrialisation's economic development for selected 26 African and 26 Asian countries. We present both short-run and long-run coefficients. Regression results confirm that GDP per capita, capital formation, human capital and industrialisation are important for African and Asian economies' economic development. Furthermore, government expenditure and inflation negatively affect economic development in both continents. However, investment and institutions impact positively on economic development only in Asian economies while gender inequality negatively affects economic development only in African countries. Moreover, there is sufficient evidence that industrialisation's short-run and long-run impact on development in Asian economies is jointly influenced by institutions and investment climate. Thus, investment climate and institutions moderate industrialisation's economic development impact only in Asian economies. Nevertheless, this evidence is missing in African regression data because African countries generally lack technology, human and physical infrastructure, formalised industries, industrial and institutional capacity due to informality and coordination between and within government agencies and private sector. Improving these could change the development trajectory of Africa.

For a long-time, Africa has been exploited by the west. First, Africa was under the west's colonisation for more than a century. Second, SAPs causes premature deindustrialisation (Rodrik, 2016) disturbed Africa's industrialisation process as they discourage government intervention and spending in sectors of the economy, such as manufacturing and agriculture sector and infrastructure developmental projects, which are key to development. SAPs also encourage privatisation of state-owned enterprises whereas in other countries such as Brazil, France, India, Singapore and South Korea (Chang, 2007b), Brazil, China and USA (Mazzucato, 2013) and China

(Wang, 2021), state-owned enterprises have acted as conduits of industrial development. Actually, implementation of selective industrial policy was the pillar of industrialisation and economic development success in Asia. Third, coups and political interferences by the west also affect development and implementation of economic development policies. Lastly, the colonial experience, social colonial structure and ethnic conflicts in Africa are too different from those occurred in Asia. These political issues could be the reason why both institutional quality and investment climate have insignificant impact on industrialisation's economic development impact in Africa.

These results have policy implications for African and Asian economies in that they should continuously focus on policies that seek to address GDP, capital formation, government spending, human capital, inflation and industrialisation to achieve high economic development. More importantly, Africa should address gender inequality to realise more development. They should also address deficiencies in fundamentals like infrastructure, ensure meritocracy in public service and coordination of activities between private and public sector through designing and implementing activist industrial policy. These could have long-run economic development benefits and enhance the impact of institutions and investment climate on both industrialisation and economic development. Since industrialisation is cardinal to Africa and Asia's economic development, governments and policymakers should prioritise industrial policy or any policy that encourages industrialisation. African countries can boost the significance of industrialisation by promoting appropriate government intervention and industrial policy targeting industries with high technology usage and high backward and forward linkages.

Nevertheless, as Chang and Andreoni (2019) suggest there are certain forms of institutions, that is institutions of production, productive capabilities development, corporate governance, industrial financing, industrial change and restructuring and macroeconomic management for industrialisation that developing countries need to focus on in order to promote industrialisation. Developing countries that are aspiring to industrialise have to simultaneously adopt, develop and implement these various forms of institutions. Furthermore, the success of both investment and institutions in impacting industrialisation requires long-term cheap financing. Successful industrialisation does not only require long-term financing but also long-term investments in specific human and physical capital. Industrialisation through manufacturing sector is more

demanding than through agriculture and services sectors because its restructuring requires high technology intensity and political will.

The starting point for successful industrialisation requires that the state not the market to oversee development. However, there should be no wrong prioritisation and bad management by the government. Another important aspect is reorienting the education system towards scientific and technical fields e.g., chemistry, mathematics, science, technology, physics. Also, public service positions should be occupied based on merit with little or no room for rent-seeking behaviours. However, these are possible when there is no conflict of interest between arms of government and the state. Last but not least, leaders should have motivation to develop their country and at the same time made accountable for their actions.

The other reason why African countries perform bad in industrial and economic development is because of states that do not support institutional development investment attraction and protection. Also, the little investments that take place do not promote industrialisation of the manufacturing sector but instead are found in primary sector where little value addition and beneficiation takes place. Another problem affecting African economies' pursuit for industrialisation and economic development is lack of strong and effective coordination within and between government departments. Even in sectors where governments try to offer support for industrialisation, there is lack of refereeing and clearly defined policies to implement and monitor projects.

CHAPTER 5

CONCLUSION

5.1 SUMMARY, POLICY IMPLICATIONS AND RECOMMENDATIONS

The thesis highlights the importance of industrialisation, industrial policy, institutions and investment climate to economic development by making comparisons between selected African and Asian economies. The idea to make comparisons is to provide Africa with useful lessons for industrialisation and economic development. In Chapter 2, the thesis explores the empirical and theoretical contributions of industrialisation, institutions and investment climate to economic development. It also explains the state and market's roles in economic development and industrialisation processes, and what orthodox and heterodox economics advocate. Mainstream economics argue that the state fails and should just create an enabling environment for private sector or the market to lead industrialisation and economic development. Nevertheless, the market also fails, and reality shows that the state was behind the industrialisation process and economic development of advanced economies. The state's role is beyond being an enabler, but also act as a producer or consumer, financier and innovator. The justifications for disregarding activist industrial policy because of state failure are misplaced and not a guarantee for success of market-led industrialisation.

Chapter 3 presents and discusses industrial-level designing and implementation of industrial policy in selected eight Asian and four African economies. The evidence shows that all the countries that adopted activist industrial policy generally achieved success although this success is more notable in Asian economies than in African economies. Because of lack of capabilities African countries are finding it difficult to develop and gain market share in industries that have even acted as low entry points for manufacturing sector. On the contrary Asian economies developed capabilities, which enabled them to participate in high-capital and high-technology demanding sectors with high-value. These were possible through activist developmental state. The state nurtured promising industries with multiple economic linkages. It also used carrots-and-sticks (incentives and penalties) to reward and punish firms or companies that abused privileges or support and met agreed targets respectively. Their governments started by building productive capabilities and made it mandatory for foreign firms to partner with local firms and to transfer technology. Furthermore, governments of Asian economies were able to

effectively manage rents. Behind all these was a committed leadership with a pro-development mind-set. Government's role in formulating and implementing industrial policy between economies in the two continents is evident in the automobile industries of Asia (China, Japan, South Korea and Thailand) and Africa (Morocco and South Africa). The success of industrial policy implementation in Asia could provide learning lessons for Africa.

Chapter 4 examines institutions and investment climate's moderating roles on industrialisation's economic development impact in selected African and Asian economies. We hypothesise that improvements in investment climate and institutional quality enhance industrialisation's impact on economic development. We use regression model (system GMM) to examine the moderating roles of investment climate and institutional quality on industrialisation. The moderating role is only evident in Asian economies. Despite lack of evidence of institutions and investment climate's moderating roles on industrialisation in Africa, industrialisation remains important in Africa's economic development.

Case studies results show that activist industrial policy promotes industrialisation and development while regression results reveal that institutional quality and conducive investment climate enhance industrialisation's economic development in Asian economies. Developed and now developed Asian economies like China, Taiwan, South Korea, Japan, etc not only used FDI to develop, but also their domestic investments. Development of a domestic investment requires a system that promote developmental industrial projects by local investors through securing their investments, stabilising the operating business environment and implementing policies and regulations that safeguard and support local investments. Also, developing countries in general should build strong institutions that control corruption and prevent individuals, especially politically connected leaders from enriching themselves and being used as conduits to enrich politicians at the expense of all the population. This is possible when there is no conflict of interests and separation of power between government and state as well as meritocracy, transparency and accountability for those occupying public offices. A well-developed industrial sector leads to high and long-term economic development. African economies also need to implement these measures in order to attain high economic development and as well be able to catch up. However, catch up is possible through technology advancement.

In concluding, we highlight that the conditions under which Africa as a latecomer has to industrialise are completely different from those experienced by Asia, thus attaining sustained growth and economic development becomes difficult. First, Africa should adopt activist industrial policy, and the policy should be country-specific and context-based. However, in Africa the effectiveness of adopting and implementing industrial policy as well as the significance of institutional quality and investment climate require that governments should address structural deficiencies in infrastructure, knowledge and technology gaps and rent-seeking behaviours, as well as building institutional capacity and productive capabilities. Addressing these enhance manufacturing sector's competitiveness and growth. Industrial policy success also entails meritocracy and patriotic leadership in positions of influence. Not having quality human capital and physical infrastructure as well as technology upgrading could strengthen preindustrialisation deindustrialisation. Industrialisation in Asia was driven along same approaches as it was well-monitored with a framework of rewards and punishments or penalties. Companies benefiting from government support had to sign off performance scorecards with clear time bound targets. It also involved a high degree of transparency and integrity on both government and industry.

The current global rules are less friendly for activist industrial policy, thus African countries have to methodologically review their investment and trade policies and any other international agreements to ensure implementability of activist industrial policy. Governments can use subsidies and tariffs in a smart way to protect infant industries with great potential to create high linkages and promote innovation. Selection and monitoring who should benefit from the subsidies and tariffs is key to industrial policy success. Also, African countries need to do intra-industrialisation and intra-investment in infrastructure at regional or bilateral level so that they can boost industrialisation levels.

Although we use both case studies and econometric analysis to try to capture or explain details and influence of industrial policy, industrialisation, economic development, policy interventions, ideology, type of institutions and other factors. There are some variables both outside and inside the economic domain which both case studies and regression analysis cannot correctly and fully capture. These variables include meritocracy, policy credibility, governance issues and other political economic factors. Measuring these factors and their economic development impact using regression and analysing them using case studies are not easy tasks.

Besides, there are certain institutions and ideas that matter to industrialisation, economic development and policy agenda setting yet they are not measurable and regression analysis fails to capture their impact. Furthermore, we therefore propose further researches to explore deeper into these neglected but important areas. This is because industrialisation and development are a political economy yet African politics is not pro-development. Even though having a lot of resources and good infrastructure are key for development, but without astute leadership and strong institutions they are not enough for stimulating development. Government should establish mechanisms through strong institutions to optimally use FDI for the benefit of the country not individually. Even with bad leaders, as long as the right knowledge is applied a country can benefit from FDI and manage to develop.

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