Manufacturing Value Added Development in North Africa: Analysis of Key Drivers

By

John C. Anyanwu[1]
Macroeconomic Policy, Forecasting and Research Department
African Development Bank
Avenue Joseph Anoma
01 BP 1387
Abidjan, Cote d'Ivoire
E-Mail: J.ANYANWU@AFDB.ORG

Keywords: Manufacturing, Manufacturing Value Added, Diversification, Key Drivers, North Africa.
JEL Classification: L16, L60, N60, O14, O55, O57.

[1] The views expressed here are those of the author and in no way reflect those of the AfDB and its Executive Directors.

ABSTRACT

It is widely recognized that structural transformation lies at the heart of economic development of any nation. Recent research suggests that the industrial sector, especially manufacturing, is a key engine of growth in the development process, including that of North Africa. The necessity for structural transformation in North Africa arises from the fact that the sub-region needs high and sustained economic growth in order to make significant progress in generating increased productive and quality jobs and livelihood for its teeming population, especially the youth. Unfortunately, manufacturing development in North Africa has not improved over time. For example, its manufacturing value added (MVA) in world MVA accounted for only 0.10 percent of world MVA in 2013. Also, the share of North African MVA in GDP was just 16.00% in 2013 compared with Asia & Pacific's 25%. This paper empirically assesses the key drivers of manufacturing value added in the sub-region using a time series cross-sectional data set of the countries for the period, 1990 to 2014. Two estimation techniques, the pooled panel OLS regression with year fixed effects and the IV-2SLS estimation procedure, were used. There is also a strong support for a non-monotonic, cubic (third degree polynomial) relationship between MVA with economic development. The following factors are found to exert significant positive effect on manufacturing added in North Africa: secondary education, agricultural land, domestic credit to the private sector, trade openness, inward stock of FDI, population size, and ICT infrastructure/technology. On the other hand, the results indicate that dependence on oil, mineral and natural gas rents, domestic investment rate, political globalization, institutionalized democracy, age dependency ratio (young), and civil violence have significant negative effect on MVA in the sub-region. The paper concludes with policy recommendations.

I. Introduction

It is widely recognized that structural transformation lies at the heart of economic development of any nation. Recent research suggests that the industrial sector, especially manufacturing, is a key engine of growth in the development process, including that of North Africa. The necessity for structural transformation in North Africa arises from the fact that the sub-region needs high and sustained economic growth in order to make significant progress in generating increased productive and quality jobs and livelihood for its teeming population, especially the youth. It is an essential mechanism for diversifying the economy and building resilience to external shocks (UNCTAD, 2011, 2013; KPMG, 2014). This is especially against the background of low economic growth in the sub-region in recent years. For example in 2014, the sub-region's economic growth was only 1.4%. At the same time, very high unemployment, especially for the youth and females, prevails in the sub-region.

As KPMG (2014) rightly notes, very few countries have been able to grow and accumulate wealth without investing in their manufacturing industries, and a strong and thriving

manufacturing sector usually precipitates industrialization. This is because of the labor-intensive, export-focused nature of the industry. By increasingly adding value to commodities before they are sold, revenues are boosted, thus raising average earnings per input. In addition, the manufacturing sector is more sustainable and less vulnerable to external shocks than primary commodities, for example. Indeed, recently, African countries (including those in North Africa) have been buffeted by four very serious and interrelated external shocks, namely hikes in food prices, increases in energy prices, the global financial and economic crisis, and the ongoing collapse in commodity (especially oil) prices that started in 2014, whose economic and social costs in North Africa have been quite substantial. These quadruple crises have refocused attention on North Africa's high vulnerability to external shocks and the need for North African policymakers to take urgent action to diversify their production and export structure to build resilience to external shocks. Manufactured exports have a much wider scope and more stable demand than primary commodity exports just as a strong manufacturing industry contributes to the development of the private sector, which further increases the economy's resilience to external shocks. In addition, manufacturing goods locally to supply the domestic market has a positive impact on the structure of the trade balance, improving external accounts.

Unfortunately, manufacturing development in North Africa has not improved over time. Since 2004, the Asia and Pacific region has been the biggest manufacturing region in the world, driven mainly by China. Its manufacturing value added (MVA) in world MVA stood at 44.6% in 2014. However, North Africa's MVA remains very low and accounted for only 0.10 percent of world MVA in 2013. While North Africa's share of global manufacturing exports was only 0.10% in 2013, in low- and middle-income countries in Asia and the Pacific it was a high of 24.3% in the same year. Worse still, the share of North African MVA in GDP was just 16.00% in 2013 compared with Asia & Pacific's 25% (UNIDO, 2015).

This paper extends and contributes to the literature on the key drivers of manufacturing value added development in North Africa in four ways. Firstly, we show why manufacturing development matters and hence why policymakers need to put high and increased focus on it so as to scale it up substantially. Secondly, we document stylized facts on recent manufacturing development in North Africa. Thirdly, the paper empirically assesses the key drivers of manufacturing value added in the sub-region using a time series cross-sectional data set of the countries for the period, 1990 to 2014. Fourthly, we offer policy suggestions in light of the evidence that would help North African countries to effectively tackle the problems hindering manufacturing development in the sub-region with a view to scaling up and "breaking into" substantial manufacturing development across the countries, providing a strong product diversification vehicle.

This study is also important as it will help point the way towards the attainment of Sustainable Development Goal (SDG) 9, which is to "build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation". This is more so since the attainment of this Goal is a primary engine not only of feeding Africans, job creation, and economic growth but also of investment flows, skills development, and technology transfer. In particular, Goal 9.2 aims at promoting inclusive and sustainable industrialization and, by 2030, significantly raising industry's share of employment and gross domestic product, in line with national circumstances, and doubling its share in least developed countries.

The remainder of the paper is organized as follows. Section II presents a brief review of the literature, while Section III discusses key stylized facts. Section IV presents the model and data. Section V presents and discusses the empirical results while Section VI concludes with policy implications.

II. Brief Review of the Importance of Manufacturing and the Literature on Its Key Drivers

As Szirmai (2009) argues, since the late 18th century, the manufacturing sector has been the main engine of growth, development and catch up. He further argues that manufacturing is important for growth. This is because (a) there is an empirical correlation between the degree of industrialization and per capita income in developing countries; (b) productivity is higher in the manufacturing sector than in the agricultural sector; (c) manufacturing is assumed to be more dynamic than other sectors; (d) developing countries with higher shares of manufacturing and lower shares of services show faster growth than the advanced service economies; (e) compared to agriculture, it is argued that the manufacturing sector offers special opportunities for capital accumulation; (f) the manufacturing sector offers special opportunities for economies of scale, which are less available in agriculture or services; (g) the manufacturing sector offers special opportunities for both embodied and disembodied technological progress; (h) linkage and spillover effects are stronger for manufacturing than for agriculture or mining; and (i) as per capita incomes rise, the share of agricultural expenditure in total expenditure declines and the share of expenditure on manufactured goods increases (Engel's law).

More recently, Haraguchi (2016) argues that the importance of manufacturing relative to agriculture for economic growth has been attributed to the higher economies of scale of the former, higher income elasticity of demand for manufactured goods and higher potential of productivity catch-up of the manufacturing sector (see also Kaldor, 1967; Chenery et al., 1986; Rodrik, 2011; Weiss, 2011). Though manufacturing normally ceases being a dominant engine of growth when countries reach a high per capita income, depending on geographic and demographic conditions as well as other country-specific factors, developing regions like North Africa are way far behind that stage.

Manufacturing is also key element of economic diversification – economic (product) and export. And diversification is needed to overcome economic vulnerabilities that African economies are facing. Diversification also exposes producers to a wider range of information, including about foreign markets, and so raises the number of points for potential "self-discovery". In essence, as Gelb (2010) puts it, capability in one sector can open the way to others, especially those that use related knowledge.

Very few countries have been able to grow and accumulate wealth without investing in their manufacturing industries, and a strong and thriving manufacturing sector usually precipitates industrialization as a key diversification component: manufacturing is labor-intensive & export-focused; by increasingly adding value to commodities before they are sold, revenues are boosted, thus raising average earnings per input; manufacturing development enables dynamic learning-by-doing gains that raise productivity and income; the manufacturing sector is more sustainable and less vulnerable to external shocks than primary commodities, for example; and recently, African countries have been buffeted by four very serious and interrelated external shocks, namely hikes in food prices, increases in energy prices, the global financial and economic crisis, and the ongoing collapse in commodity (especially oil) prices that started in 2014, whose economic and social costs in a number of African countries have been quite substantial. These quadruple crises have refocused attention on Africa's high vulnerability to external shocks and the need for African policymakers to take urgent action to diversify their production and export structure to build resilience to external shocks. In addition, a strong manufacturing industry contributes to the development of the private sector, which further increases the economy's resilience to external shocks. Manufacturing goods locally to supply the domestic market has a positive impact on the structure of the trade balance, improving external accounts (see UNIDO, 2015; Anyanwu, 2016).

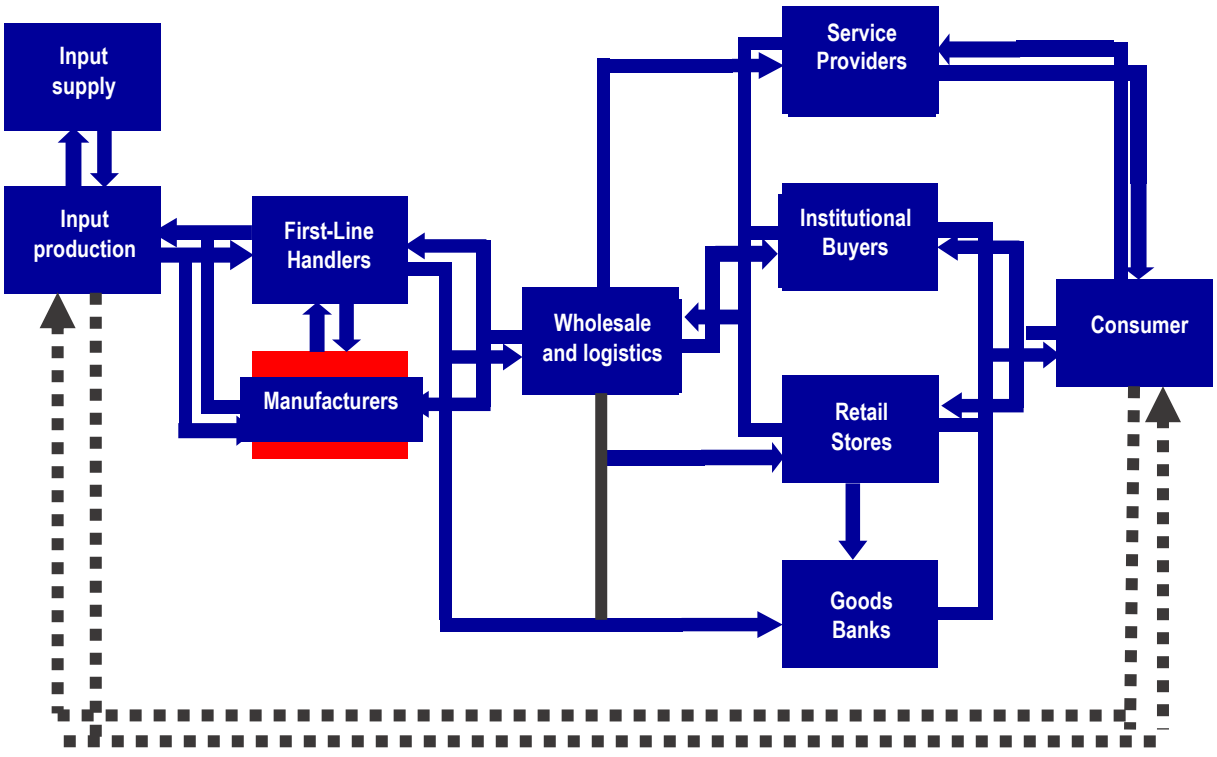
In developed economies, a sizeable body of literature has attempted to account for the broad set of empirical regularities that characterize manufacturing, emphasizing value addition, output and employment both across countries and over time. This paper contributes to the literature by, primarily, examining the key drivers of manufacturing development in North African countries.

For the purposes of this paper, African countries' manufacturing system provides the population with a variety and widely available supply of products. It does so through a supply chain of producers, manufacturers (processors), and distributors that provide goods to consumers. Figure 1 illustrates the position and role of manufacturers in the multilayered, dynamic, and multi-purposed product supply chain.

The permeable borders of this dynamic supply system connect it both to a global production system and to a diverse, changing broader economy and society. One of the

major characteristics of the manufacturing sector is its strong up- and down-stream linkages. Upstream, the manufacturing sector links to input suppliers, including those in primary agriculture, across a variety of production models and products. Downstream, its outputs are both intermediate products to which further value is added and final goods, which are marketed for final consumption through wholesale and retail chains as well as a diverse array of franchises. Such link with agriculture and other input suppliers makes manufacturing critical for feeding Africa, reducing hunger and mal-nourishment, reducing poverty, and creating jobs. Indeed, manufacturing firms in Africa are critical in spurring rural development, attracting foreign direct investment, providing enormous employment for women and youth, providing market for financial institutions within the agribusiness setting, and contributing to foreign exchange earnings. In addition, manufacturing industries play important roles in providing direct market access to producers, investing in hard and soft infrastructure at rural and urban levels, transferring production and processing technologies, processing and supplying manufactured products to the population, and engaging in direct export.

Figure 1: The Position and Role of Manufacturers in the Goods Supply Chain



Source: Adapted from Institute of Medicine (IOM) and National Research Council (NRC) ((2015).

Below, we present a brief overview of the literature on the determinants of manufacturing development to motivate our analysis.

Recently, Haraguchi and Rezonja (2011a, b; 2013) and Haraguchi (2016) reworked the original cross country analysis in Chenery (1960) and Chenery and Syrquin (1975), explaining a measure of manufacturing activity by 18 sectors at the 2 digit ISIC level by a country's income level, population size, a measure of natural resource endowment and dummy variable for geography. The analysis is conducted separately for small and large economies based on absolute size of GDP. The results indicate that for most manufacturing activities, the coefficient on income is positive and significant and on income squared it is negative indicating a rising role for each manufacturing activity with income controlling for other factors, which peaks at a different income level for different manufacturing activities. Manufacturing industries are therefore classified into early, middle and late depending on the level of GDP per capita at which each reaches its peak share in GDP.

The positive and significant impact of high population density found by Haraguchi and Rezonja (2011a, b; 2013) and Haraguchi (2016) suggests that densely populated countries possess logistical and agglomeration advantages, which would be especially conducive to the development of industries that involve relatively complex and lengthy production processes and supply chains, such as the machinery and equipment and electrical machinery industries. On the other hand, high natural resource endowments have negative impacts on most manufacturing industries. At the same time, country-created conditions such as institutions, history and policies, produce systematic and consistent differences in the potential levels of manufacturing development across countries over a long period of time.

According to Chenery and Syrquin (1975), structural change in manufacturing is attributable to (a) the demand and supply changes associated with income level, (b) the country's given demographic and geographic conditions, and (c) the country's created conditions. As Katz (2000) elaborated, a country's geographic and demographic conditions implies natural advantages or disadvantages in the development of certain industries. As an illustration, holding other conditions constant, an endowment of abundant natural resources usually works against manufacturing development as found by Haraguchi and Rezonja (2010) and UNIDO (2012). Lin and Chang (2009) have also elaborated on the fact that country-created conditions such as history, culture and policy matter for manufacturing development.

The European Commission (2009a, b) examines the key drivers of per capita value added in various sectors for twenty-five EU countries. Those sectors are food, beverages, tobacco; textiles; clothing; leather; wood and wood products; pulp and paper; publishing, printing, and reproduction; coke and refined petroleum; chemicals; rubber and plastics; other non-metallic mineral production; basic metals; fabricated metal products; machinery and equipment; office machinery and computers; electric machinery; radio & television; medical instruments; motor vehicles and trailers; other transport equipment; furniture and recycling; electricity, gas, and water supply; construction; and sale and

repair of motor vehicles. The findings indicate that exports and intermediate demand are the two most important demand side manufacturing output drivers, while imports and government expenditure have very little impact on growth in manufacturing. In New Member States fiscal deficits reduce output growth in a number of industries. Other results show that real interest rates have a robust negative correlation with manufacturing output growth.

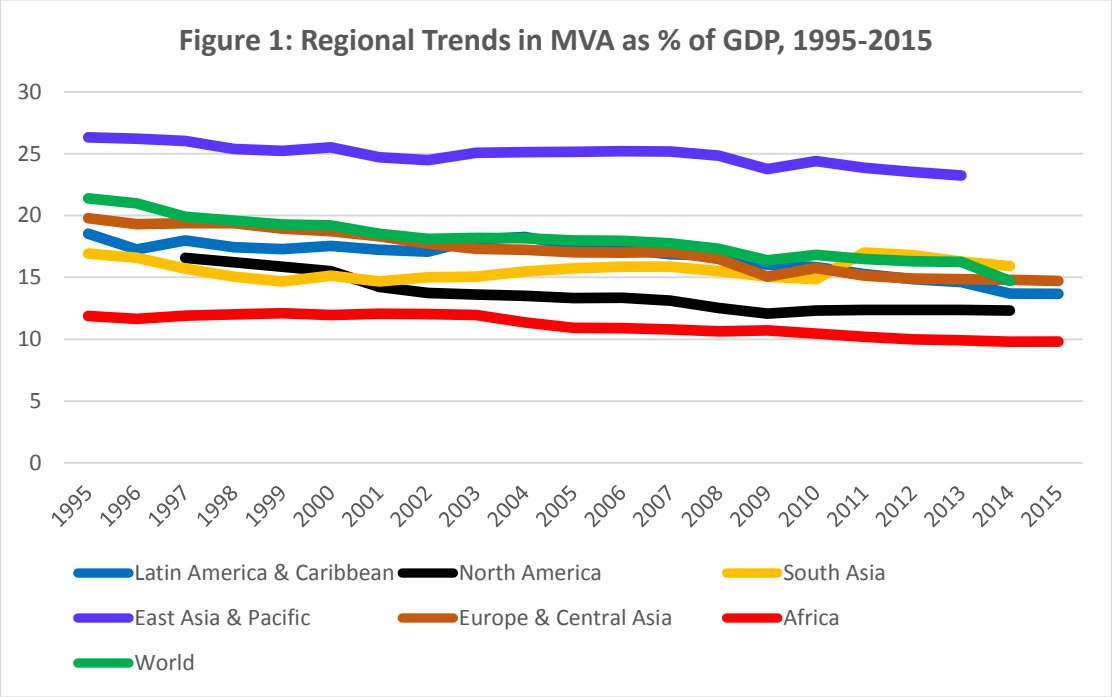
Dabla-Norris et al. (2013), in their study of benchmarking structural transformation across the world, find that a country's population, trade openness and FDI in non-resource sectors are positively and significantly associated with manufacturing value added for a panel of 168 countries over the period, 1970-2010. Also, they find that mining output share, arable land, and age dependency (young and old) are negatively and significantly correlated with manufacturing value added in those countries. In the same vein, Mensah et al. (2016) find that the level of income, arable land, population, and age dependency (young) are positively and significantly associated with manufacturing added development in Sub-Saharan Africa. With respect to agro-manufacturing, Anyanwu and Kponnou (2016) find an inverted U-shaped relationship with real per capita GDP. Key positive drivers for the entire continent of Africa include domestic investment rate, government consumption expenditure, household consumption expenditure, social and political globalization, dependence on oil, natural gas, coal and forest resources, arable land, and ICT infrastructure/technology access. Major negative drivers are trade openness, domestic credit to the private sector and population size.

The above review shows that the few studies that had been carried out on the key drivers of manufacturing value added had been outside Africa. In contrast to these papers, we examine MVA in North Africa, and account for its key drivers using a broader set of fundamental as well as policy and institutional drivers. From a policy perspective, the results of this paper will serve as a useful platform to formulate series of new agenda and policies for manufacturing development in North African countries.

III. Stylized Facts

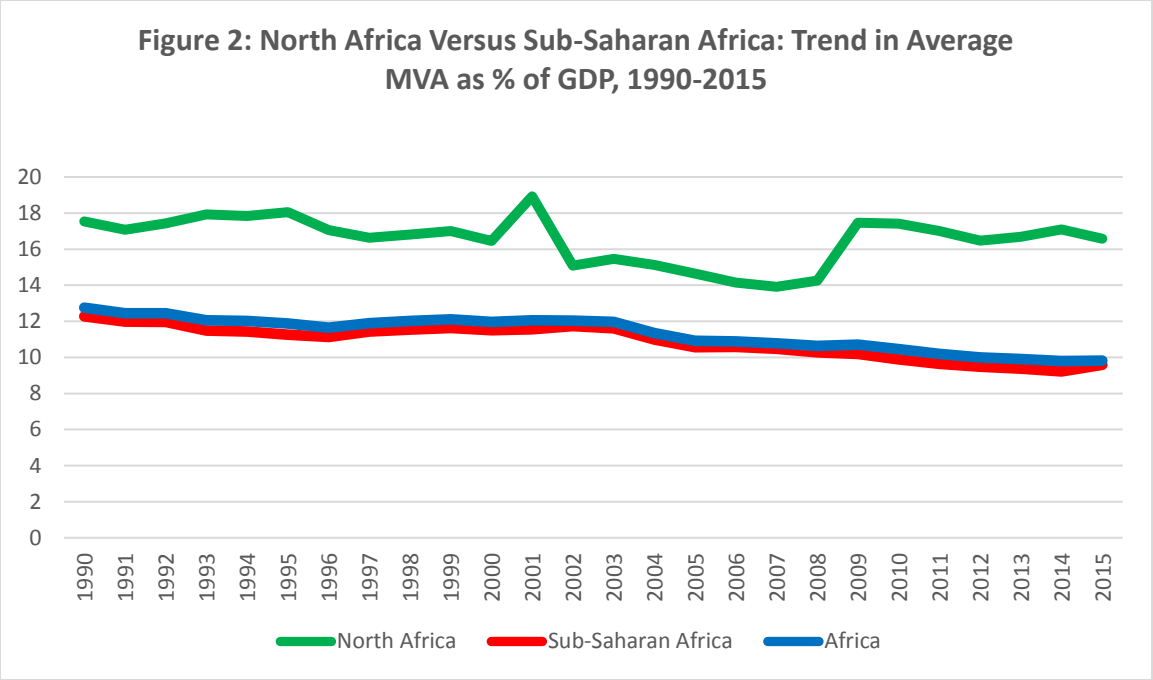
This section presents some recent stylized facts about manufacturing value added (MVA as a share of GDP. Figure 1 shows that Africa has the lowest MVA (%GDP) (averaging just 11% against East Asia & Pacific's 25% between 1995 and 2015) among the world's regions. Africa's MVA has also been on a declining trend. Africa produced just 1.4 percent of global manufacturing exports in 2014, and its share has remained within the narrow band of 1.0 to 1.5 percent since 2000. By contrast, China grew its share of global exports from 4.5 percent in 2000 to 15 percent in 2014. Also, according to McKinsey Global Institute (MGI) (2016), Africa's total manufacturing output was worth around $500 billion and the vast majority of that was focused in five countries—Egypt, Morocco, Nigeria, South Africa, and Tunisia – three of which are in North Africa. It further indicated that 70 percent of this production was focused on meeting domestic needs and was consumed

in the country of manufacture; some 10 percent was traded within Africa, and just 20 percent was exported beyond Africa.



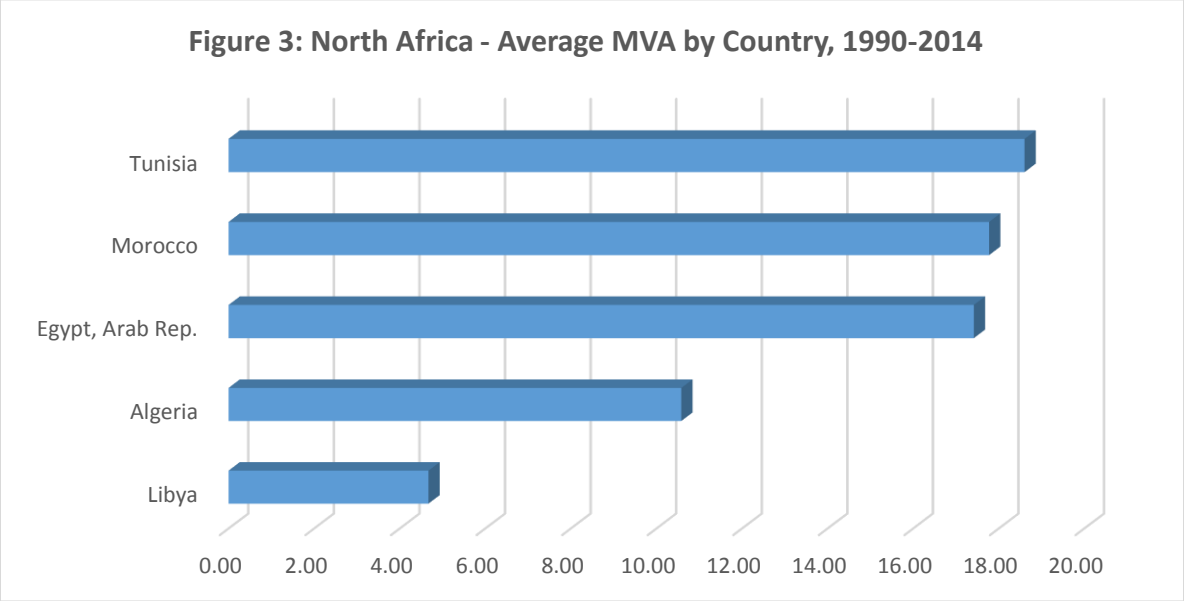
Source: Author, using data from World Bank's Online Database.

As Figure 2 demonstrates, total manufacturing value added has been consistently higher in North Africa than in Sub-Saharan Africa (SSA). It averaged almost 17 percent in North Africa as against only about 11 percent in SSA between 1990 and 2015. However, both (and hence Africa's) have assumed a generally downward trend recently.



Source: Author, using data from World Bank's Online Database.

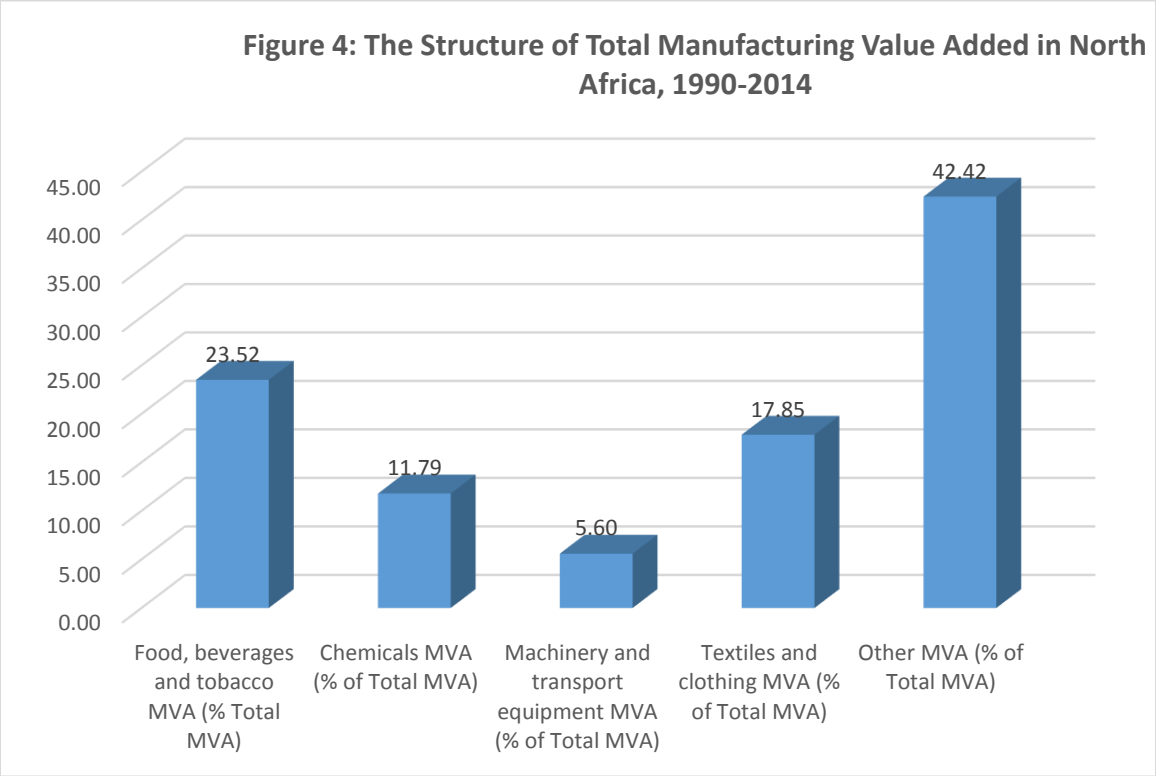
However, these sub-regional averages mask the country differences. For example, as Figure 3 shows, Tunisia has the highest average MVA as percentage of GDP at about 19 percent, followed by Morocco at about 18 percent. Egypt follows at about 17 percent.



Source: Author, using data from World Bank's Online Database.

The structure of manufacturing value added between 1990 and 2014 in North Africa is shown in Figure 4. Among the various sectors, the food, beverages and tobacco, a sector producing essential consumer foods has a fairly strong presence in the sub-region than

in industrialized countries. In industrialized countries, food manufacturing contributes well below 20 percent of the total value added of the manufacturing industry, however, its share averaged about 24 percent in North Africa between 1990 and 2014 – the highest single component of manufacturing value added. The lowest single share relates to machinery and transport equipment.



Source: Author, using data from World Bank's Online Database.

IV. The Model and Data

4.1 The Model and Estimation Technique

Based on the above literature review and following the frameworks posited by Kochhar et al. (2006), Jaumotte and Spatafora (2007), Nickell et al. (2008), Haraguchi and Rezonja (2011a, b; 2013), Haraguchi (2016), and Dabla-Norris et al. (2013), the modified relationship that we want to estimate can be written as:

$$MVA_{it} = \alpha_0 + \beta_1(\log rgdppc_{it}) + \beta_2(\log rgdppc_{it})^2 + \beta_3(\log rgdppc_{it})^3 + \beta_4(X_{it}) + \lambda_i + \varepsilon_{it}$$
$$(i = 1,...., N; t = 1,....., T),.....(1)$$

where MVA_{it} is MVA as percentage of GDP in country i at time t; α_0 is the constant term; β_1, β_2, and β_3 are the elasticities of MVA with respect to real per capita GDP in 2005, rgdppc, its quadratic and cubic terms, respectively; X is the control variables, including primary school enrolment and secondary school enrolment (education), natural resource

rents as percentage of GDP (oil, mining, and natural gas), proportion of land devoted to agriculture, domestic investment rate, domestic credit to the private sector (as % of GDP), trade openness, and FDI stock (as % of GDP). Other control variables are social globalization index, political globalization index, institutionalized democracy (polity2), civil liberties, total population (in log), age dependency (old), age dependency (young), information and communications technology (ICT) accessibility (proxied by mobile phone subscriptions (percent)), and civil violence. In addition, λ_i denotes year fixed effects, while ε_{it} is an error term capturing all other omitted factors, with $E(\varepsilon_{it}) = 0$ for all i and t. The dependent variable is MVA as percentage of GDP and the estimations are carried out for North African countries as in Figure 3 above.

As discussed by Haraguchi and Rezonja (2010, 2011a, b; 2015) and Haraguchi (2016), in the long term, it is assumed that industries undergo three development stages—pre-takeoff, growth and decline—following a pattern of a cubic function. While those industries which can sustain growth over a long period of time may have a more linear development trajectory, other industries which experience growth from a very early stage of development and only decline at a later stage, may indicate a more quadratic pattern. Thus, in addition to GDP per capita, we include square and cubic terms of GDP per capita in the equation in order for the results to denote possible patterns of manufacturing development in North Africa, depending on the statistical significance of these GDP per capita terms.

Based on the theoretical and empirical literature, we use key drivers, including a range of supply and demand factors as controls. Given the importance of income effects identified in the theoretical literature (see Chenery, 1960; Kuznets, 1971; Echevarria, 1997, 2000; Kongsamut et al., 2001; Haraguchi and Rezonja, 2011a, b), the estimates control for output per capita (log of GDP per capita in constant PPP U.S. dollars) and its square (to account for non-linearities). A country's stage of development usually has the strongest influence on manufacturing development (UNIDO, 2015). Indeed, UNIDO (2015) states that as countries increase their GDP per capita, the share of low-tech industries at low incomes rapidly declines while the shares of medium-tech and high-tech groups increase. However, theory predicts that there is an inverted U-curve relationship between economic development and share of manufacturing in value added. That is, the share of manufacturing in value added tends to increase when developing countries start growing at low levels of per capita income. It peaks at intermediate per capita incomes and later declines as services become more important at high per capita incomes.

Included also is domestic investment ratio. The European Commission (2009b) notes that the average investment ratio, used a proxy for the capital intensity, is expected to be positive as it reflects primarily the neglected capital costs. According to Tkalec and Vizek (2009), high technological intensity industries strongly react to changes in investments.

Following the widely held view that globalization can facilitate technology transfer and contribute to efficiencies in production, we include different globalization indicators. Two principal economic globalization indicators included are international trade openness (measured as the ratio of exports plus imports to GDP)(Matsuyama, 2009) and inward FDI stock (as percent of GDP). FDI can provide access to technology, to brand names, to global markets and has the potential to provide spillovers to the domestic economy (UNIDO, 2015). FDI may affect MVA through various mechanisms: boosting productivity in the long run; filling expectations of demand increase; strengthening competition and weakening oligopoly/monopoly elements; diffusing knowledge of new production processes; stimulating the entry of firms in other sectors (horizontal linkages); and creating the right conditions to enhance structural change. Also included are KOF's indices of social globalization and political globalization.

The degree of financial sector development is proxied by the ratio of domestic credit to the private sector to GDP, which is posited to enable investment in higher productivity activities, greater diversification, and risk sharing, and hence facilitate resource allocation across the economy (Levine, 2005).

Our estimates also include natural resources endowments by including the share of oil, mining, and natural gas in GDP to account for the fact that a large fraction of economic activity in resource-rich economies in Africa is subsumed by the rents from natural resources extraction. It is posited that the endowment of abundant natural resources normally works against manufacturing development, holding other conditions constant (Haraguchi and Rezonja 2011a, b; UNIDO 2012). UNIDO (2015) shows that high natural resource endowments do not have a positive effect on a single industry, but they have particularly strong negative effects on electrical machinery and apparatus, motor vehicles (for large countries) and chemicals, which are key in deepening and sustaining industrialization from the upper middle-income stage. This is largely because exports of resource commodities often lead to currency appreciation, making tradable manufacturing products less competitive. We also include proportion of agricultural land, whose product supplies manufacturing industries hence an expected positive relationship.

We include factor endowments, such as population and domestic investment (as percent of GDP) as a proxy of capital stock. Chenery and Taylor (1968) show that a country's population size tends to have overarching influence on economic structural change. UNIDO (2015) shows that a larger population is generally conducive to manufacturing development though there are differences in structural change within manufacturing between large and small countries. Large countries, at higher incomes, tend to have a divergent pattern of thriving and other industries, while in small countries, growth in most manufacturing industries slows at higher incomes. Our estimates include age

dependency ratios (i.e., the non-working old and young populations as fractions of the labor force) since they can affect labor supply, savings and consumption behavior.

The accessibility to ICT technology and infrastructure or service can influence MVA by either facilitating or obstructing the reallocation of resources. To capture this, we include telecommunications network as proxied by mobile phone and fixed phone subscriptions (as percent). An increase in access to such ICT in the manufacturing sector can contribute to increase in MVA by eliminating relative price distortions and facilitating the reallocation of labor and other inputs, thereby raising sector productivity.

The effect of educational attainment (see Lee and Wolpin, 2006) on MVA is captured by including the shares of primary and secondary education enrollment. Increased human capital leads to improved productivity, both in sectors and overall, while it allows for operating more complicated tasks and producing outputs that are "high-skill". High levels of human capital increase the scope that new technologies are appropriate. Also, while human capital could imply positive externalities, it is observed that foreign direct investments (FDI) tend to locate in human capital-rich places. Thus, to benefit from FDI knowledge externalities and technology transfer requires that domestic firms have sufficiently high human capital levels or absorptive capacity.

Institutionalized democracy is represented by polity2 and it is expected to be positively correlated with MVA. Another political institutional variable relates to civil liberties/rights from Freedom House. Generally, civil conflicts have economic costs and consequences, including destructions (infrastructures, victims, livestock); social disorder (insecurity, decrease of productivity); dissaving (decrease in capital stock); diversion of productive expenditure towards unproductive expenditure; capital flights (physical, human and financial); and decrease in the stock of productive factors, national income and growth, thus putting 'development in reverse' (see Anyanwu, 2014).

In particular, civil conflicts adversely affect manufacturing development because they lead to the destruction of productive forces (especially human and physical capital) of the economy, increase in transaction costs, reduction in social spending, and disruption of economic activity due to an unsafe business environment (Bircan et al., 2010). Also violence- or conflict-affected countries may have adverse impacts on manufacturing companies' operations and/or on their relationships with third parties, including suppliers or other actors in the supply chain (OECD, 2011). In addition, such conflicts could cause severe disruptions of the main transportation routes or production hubs. Such poor transport adds to production and marketing costs, while damage to infrastructure worsens this situation by, for example, raising traders' or distributors' margins. In addition, growing security concerns due to violence and civil conflicts usually increase investment in the defense and security industry, causing a range of new industry regulations and requirements across supply chains and transport networks that may disrupt manufacturing development (Mueller and Stewart, 2011; see also WEF, 2012).

4.2 The Data

Data for the North African countries (1990 to 2014) for the variables in equation (1) are largely drawn from the World Bank's WDI Online database, except institutional democracy (polity2) from the PolityIV Project Online (2015) (see also Marshall et al, 2016), KOF's indices of social globalization (comprising personal contacts, information flows, and cultural proximity) and political globalization (comprising embassies in country, membership in international organizations, participation in UN Security Council Missions, and international treaties) developed by Dreher (2006) (see also Dreher et al., 2008), and civil liberties (on a scale of 1 to 7 with 1 representing the most free and 7 the least free rating) from Freedom House. The descriptive statistics are presented in Table 1. It reports the sample mean, median and standard deviation of the variables used in the estimations.

Table 1: Descriptive Statistics of Main Regression Variables

Variable	Observations	Mean	Median	Standard Deviation
MVA (% of GDP)	93	16.07	17.4	4.25
Log of Real GDP per capita	116	9.099	9.101	0.492
Primary school enrolment ratio	102	103.11	106.75	12.80
Secondary school enrolment ratio	90	67.84	68.95	19.46
Oil rent (%GDP)	120	14.41	8.00	16.54
Mining rent (%GDP)	120	0.38	0.00	1.10
Natural gas rent (%GDP)	120	3.75	1.45	4.90
Agricultural land (% of land area)	120	31.80	16.8	27.64
Domestic investment (%GDP)	119	24.65	24.70	7.64
Domestic credit to private sector (%GDP)	125	36.02	32.40	21.68
Trade openness	125	69.43	63.60	22.10
FDI stock (%GDP)	125	26.95	22.30	21.08
Social globalization index	120	37.64	38.55	8.45
Political globalization index	120	75.55	82.15	15.64
Institutional democracy (Polity2)	125	-4.17	-5.00	2.95
Civil liberties	125	5.29	5.00	0.999
Log of population	125	16.83	17.16	0.95
Age dependency ratio (Old)	125	8.10	8.3	1.52
Age dependency ratio (Young)	125	53.49	51.70	12.09
Mobile cellphone subscriptions (per 100 people)	125	39.93	5.9	51.46
Civil violence	125	0.09	0.00	0.28

Source: Author's calculations, using data estimation data.

V. Empirical Results

We investigate the key drivers of manufacturing development in North African countries, using the pooled OLS and IV-2SLS estimation techniques. Coefficient estimates of MVA (as % of GDP) equation are presented in Table 2. Column 2 presents the pooled OLS estimates. Chenery and Syrquin (1975) view income level as a universal factor of structural change while Haraguchi and Rezonja (2010, 2011a, b; 2015) and Haraguchi (2016) find that the stage of economic development is the most fundamental force of structural change as the differences in supply and demand capabilities associated with changing income levels drive the emergence of certain industries. What does the evidence show for North African countries? We find from the pooled OLS results that the level of economic development of a country is a fundamental factor in shaping its manufacturing development. The relationship between MVA in North Africa and the level of economic development (log of real GDP per capita) is approximated by a third degree polynomial. There is a positive significant relationship between the level of real GDP per capita and MVA while there is a significant negative relationship between the quadratic real GDP per capita and MVA. The cubic real GDP per capita has a significant negative relationship with MVA in the sub-region.

Secondary education enrollment is positive and statistically significantly correlated with MVA in North Africa. With respect to the role of natural resources, our results indicate that oil and mineral resource dependence have significant negative association with MVA in North Africa. The credit variable has a positive and statistically significant effect on MVA in the sub-region in line with the results of Dabla-Norris et al. (2013).

We investigated aspects of globalization that have been implicated as key drivers of MVA in the sub-region. Our results indicate that trade openness significantly increases MVA in North Africa in line with the results of Dabla-Norris et al. (2013). We find that inward stock of foreign direct investment (FDI) is significantly and positively related to MVA in the sub-region, also supporting the findings of Dabla-Norris et al. (2013).

One of the innovative aspects of this paper is the inclusion of other aspects of globalization, namely social and political globalization. Our results show that political globalization is negatively and significantly associated with MVA in the sub-region. This shows that North African countries' establishment of embassies in foreign countries, membership in international organizations, participation in UN Security Council Missions, and international treaties help to generate influences that decrease MVA in the sub-region. However, social globalization is negatively but insignificantly associated with MVA in North African countries.

We next assess whether the quality of political institutions affects manufacturing development in North Africa. Our results indicate that institutionalized democracy is negative in sign and significant in North Africa.

Table 2: OLS and IV-2SLS Estimates of the **Key Drivers of MVA (%GDP) in North Africa** (with time fixed effects), 1990-2014		
Variable	**Pooled OLS**	**IV-2SLS**
Real GDP Per Capita	1903.937 (8.27***)	1446.622 (2.93***)
Real GDP Per Capita^2	-244.280 (-8.41***)	-183.526 (-2.89***)
Real GDP Per Capita^3	10.423 (8.51***)	7.745 (2.84***)
Primary school enrolment	0.008 (0.25)	0.014 (0.68)
Secondary school enrolment	0.141 (4.18***)	0.150 (6.29***)
Oil rent (%GDP)	-0.242 (-3.31***)	-0.153 (-2.54**)
Mineral rent (%GDP)	-0.759 (-2.59**)	-0.770 (-3.94***)
Natural gas rent (%GDP)	-0.168 (-1.47)	-0.317 (-3.35***)
Agricultural land	0.040 (1.07)	0.054 (2.09**)
Domestic investment (%GDP)	-0.018 (-0.34)	-0.076 (-1.84*)
Credit to private sector (%GDP)	0.029 (1.90*)	0.038 (2.98***)
Trade Openness	0.068 (2.45**)	0.061 (3.04***)
FDI Stock (%GDP)	0.092 (2.14**)	0.079 (2.05**)
Social globalization	-0.42 (-1.10)	-0.036 (-1.37)
Political globalization	-0.035 (-1.86*)	-0.038 (-2.85***)
Democracy	-0.265 (-1.82*)	-0.308 (-3.24***)
Civil liberties	-0.309 (-0.77)	-0.380 (-1.34)
Log of population	6.996 (2.48**)	7.738 (2.30**)
Age dependency ratio (Old)	0.400 (0.88)	-0.070 (-0.11)
Age dependency ratio (young)	-0.181 (-1.14)	-0.279 (-2.30**)
Mobile cellular subscriptions	0.031 (1.46)	0.029 (1.93*)
Civil Violence	-0.778 (-1.77*)	-0.556 (-1.88*)
Constant	-5056.513 (-8.07***)	-3918.441 (-2.94***)
Year Dummies	Yes	Yes
R-Squared	0.9893	0.9865
F-stat/Wald chi^2	67.98	5554.78
Prob > chi^2	0.0000	0.0000
N	79	76
Tests of overidentifying restrictions		
- Sargan		11.6817 (p=0.1115)
- Basmann		4.17735 (p=0.7591)
Tests of endogeneity		
- Durbin		4.76353 (p=0.1900)
- Wu-Hausman		0.601824 (p=0.6194)
Note: t-values are in parentheses; ***= 1% significant level; **=5% significant level; *=10% significant level. Source: Author's Estimations.		

Consistent with Dabla-Norris et al. (2013), we find a strong positive relationship between a country's total population and manufacturing development. Our results also indicate that civil violence in North African countries is significantly negatively associated with MVA in the sub-region.

One possible problem with the pooled OLS estimate is that it assumes that all of the right-hand side variables in the model — including real per capita GDP — are exogenous to MVA. However, it is possible that real per capita GDP may be endogenous to MVA. Reverse causality may be taking place: real per capita GDP may be increasing MVA, but MVA may also be affecting the level of real per capita GDP. Without accounting for this reverse causality, the estimated coefficients in column 2 of Table 2 may be biased. One way of accounting for possible endogenous regressors is to pursue an instrumental variables approach. Therefore, to deal with this problem, we also estimate the equation,

"instrumentalizing" real per capita GDP variable with its six lagged levels, using a two-step (IV) estimation method, including time (year) fixed effects. The IV estimates are presented in column 3 of Table 2. The consistency of the IV-2SLS estimators depends on whether the instruments are valid in the MVA regression. We examine this issue by considering the tests of over-identifying restrictions. The no rejection of the null hypothesis implies that instrumental variables are not correlated with the residual and are satisfying the orthogonality conditions required. The IV-2SLS results pass the relevant tests. For example, the Sargan test of overidentifying restriction fails to reject that the instruments are valid, i.e., not correlated with the error term at conventional significance levels in the reported regression (p-value of 0.1115) while the corresponding Basmann p-value is 0.7591. Also, the estimates pass the endogeneity test with the Durbin p-value of 0.1900 and the corresponding Wu-Hausman p-value of 0.6194. We therefore base our discussions and conclusions of the key drivers of MVA in North Africa on the IV-2SLS results.

The IV coefficient estimates of the economic development (real GDP per capita) in column 3 of Table 2 similar in sign and statistical significance to their OLS counterparts. They again confirm that in the long term, manufacturing industries in North Africa follow a pattern of a cubic function. Our results resemble those of Bah (2008) for the service sector of 9 developed countries and 12 Latin American countries. They are also in conformity with the results of Haraguchi and Rezonja (2011) for wood products (small income group of countries), coke and refined petroleum (small income group of countries), electrical machinery and apparatus (medium income group of countries), and precision instruments (medium income group of countries).

Secondary education enrollment is highly positive and statistically significantly correlated with MVA in North Africa while primary education is not. This shows that that more sophisticated manufacturing products require higher levels of education.

With respect to the role of natural resources, the IV results show that oil, mineral resource and natural gas dependence have significant negative association with MVA in the sub-region in conformity with Rodrik and McMillan (2011), UNIDO (2012) and Dabla-Norris et al. (2013). But the proportion of land that is for agricultural is positively and significantly associated with a higher MVA in the sub-region, like arable land as in Mensah et al. (2016) but unlike in Dabla-Norris et al. (2013).

Domestic investment rate has negative and statistical significant effect on MVA in North Africa. As seen in Table 2, domestic investment rate is negative in sign and significant at the 10 percent level. Our estimates suggest that, on average, a one percentage increase in the share of domestic investment rate will lead to about 0.08 percentage decrease in MVA in North African countries.

However, domestic credit to the private sector remains positive and highly statistically significant (at the 1 percent level) in its effect on MVA in the sub-region. For example, a one percentage increase in domestic credit to the private sector will lead to about 0.04 percentage increase in MVA in the sub-region.

Again, economic globalization indices represented by trade openness and inward FDI stock as percent of GDP significantly (at 1 percent level) increase MVA in the sub-region. With respect to trade openness, as UNIDO (2013) states, an increase of trade openness is a growth opportunity for a country only if local resources can be deployed in adequate quantities to produce goods for the external market. Also, domestic production capabilities have to be already in place in order to respond to international competition, improve technology and exploit trade opportunities from increased liberalization.

Political globalization continue to significantly (also at the 1 percent level) and negatively associated with MVA in North Africa. Institutionalized democracy continue to have a significant (at 1 percent level) negative association with MVA. Thus, holding other variables constant, more democratic countries in North Africa tend to experience lesser levels of MVA.

A strong positive association between total population and manufacturing development continues to exist, indicating strong manufacturing demand and consumption as population increases. Age dependency ratio (young) is strongly negatively related with the MVA in North Africa, conforming to the findings of Dabla-Norris et al. (2013).

Our results show that the coefficient of the ICT infrastructure/technology variable is positive and statistically significant in influencing manufacturing development. We can conclude that increases in access to ICT infrastructure/technology tend to lead to improvements in MVA in North Africa. Again, our results also indicate that civil violence in North African countries is significantly negatively associated with manufacturing development.

VI. Conclusion and Policy Recommendations

Our empirical results can be summarized as follows:

(a) The relationship between economic development (log of real GDP per capita) and MVA in North Africa is approximated by a third degree polynomial. The coefficient associated with the level of real GDP per capita has positive and statistically significant association with manufacturing development in North Africa. But the quadratic term of real GDP per capita is negative in sign and significant while the cubic term of real GDP per capita is positively significant. These provide evidence of a third degree polynomial (cubic) relationship between real GDP per capita and MVA in North Africa;

(b) Secondary education enrollment is positive and statistically significantly correlated with MVA in North Africa;
(c) Oil, mineral and natural gas dependence have significant negative association with MVA in the sub-region;
(d) The proportion of land that is devoted to agriculture is positively and significantly associated with a higher MVA in North African countries;
(e) Domestic investment rate has negative and statistical significant effect on MVA in the sub-region;
(f) Domestic credit to the private sector has a positive and highly statistically significant effect on MVA;
(g) Trade openness significantly increases MVA in the sub-region;
(h) Inward stock of FDI has a significant positive association with manufacturing development in North African countries;
(i) Political globalization is negatively and significantly associated with MVA in the sub-region;
(j) Institutionalized democracy is negative in sign and significant at the 1 percent level in North Africa.
(k) Population is positively and significantly related with MVA;
(l) Age dependency ratio (young) is strongly negatively related with MVA in North Africa;
(m) ICT infrastructure/technology variable is positive and statistically significant in relation to manufacturing development in the sub-region; and
(n) Civil violence in North African countries is significantly negatively associated with manufacturing development.

What are the implications of these results for North African countries? First, our results confirm that the level of prosperity (higher economic development) promotes MVA in North African countries. Therefore, North African countries must take measures to increase their national incomes. To increase per capita income, North African countries must deepen macroeconomic and structural reforms to increase their competitiveness, create increasing and more quality jobs and hence increase participation in economic activity, dismantle existing structural bottlenecks to private and public investment, and scale-up investments in hard and soft infrastructure to enhance local production and regional integration. Others are structurally transform the economy for increased trade competitiveness in knowledge-intensive manufacturing, and increase productivity, especially in agriculture, through creating incentives and opportunities for the private sector and increasing government support to small farm holders in terms of finance, formalization of land ownership, and technical advice.

Second, there is need for education beyond the primary level for increased manufacturing development. In addition, it is necessary to complement formal education with technical and vocational education and training (TVET). TVET builds on formal education to deliver specialized technical training and calls for a skilled workforce capable of

operating state-of-the-art technologies. TVET programs have to overcome three main challenges, including the enhancement of its public reputation, proper and effective coordination among various agencies, and effective monitoring, evaluation and feedback mechanism. But both formal education and TVET call for explicit incentives such as vocational or engineering scholarships and demand-driven courses to train workers in the technical standards in the manufacturing sector. In addition, skill policies have to be aligned with North Africa's broader socioeconomic development agenda. This requires strong coordination between stakeholders engaged in policy-making, both public and private sectors.

Third, for long-term MVA development, North African countries with abundant natural resources need prudent institutions to manage revenues from resource exports so as to avoid undue currency appreciation and underinvestment in physical and human capital. Indeed, efficient management of natural resources in Africa requires actions throughout the value chain. In particular, a new natural resources management framework is needed for better governance, sectoral linkages, economic growth and human, capacity and infrastructure development – with strong parliamentary legislation, oversight, and representation throughout the resources value chain. Given that oil, mineral resources and natural gas are non-renewable resources, it is vital to negotiate more beneficial and transparent contracts with oil/mining Multinational Corporations operating in North Africa, and ensure that these companies do not evade taxes. For greater returns to North African countries in terms of royalties/rents, for example, the governments should engage in auctions for oil/mining rights. In this regard, international financial institutions like the African Development Bank have a critical role to play in helping these countries acquire the much-needed capacity not only to negotiate beneficial contracts but also for effective management of natural resource revenues. Other measures to promote efficient and effective allocation of public expenditure include promoting high levels of transparency, ensuring that the political system has a centralized system of financial authority and control, and the legislation of a 'fiscal constitution' that imposes ceilings (and perhaps also floors) on public spending from resource revenues.

Fourth, given our finding that domestic investment rate reduces MVA in North Africa, effectiveness of domestic must remain an active goal of governments in the sub-region. Efforts must be made to improve the efficiency and effectiveness of public institutions, if these are to serve as genuine partners with the private sector. Sustainable domestic investment needs increased human capital investment to enhance the health and welfare of populations and generate the skills required in a competitive global environment. Adoption of high level best practice principles in investment is imperative. Those broad principles should include the following key elements: a nationally coordinated approach to the development of significant strategic projects and programs; and the promotion of competitive markets. Others relate to decision-making based on rigorous cost-benefit analysis to ensure the highest economic and social benefits to the nation over the long term; a commitment to transparency at all stages of the decision-making and project

implementation processes; and a public and private sector financial management regime with clear accountabilities and responsibilities.

Fifth, for domestic credit to work for the MVA, lending rates reduction is imperative while developing the requisite lending expertise, mechanisms for monitoring, and supervisory and regulatory skills of operators of the African financial system.

Sixth, to make globalization work for increased MVA, local resources need to be deployed in adequate quantities to produce goods for the external market. In addition, domestic production capabilities have to be put into place in order to exploit trade opportunities (especially intra-regional trade), increase response to international competition, and improve technology. Indeed, North African countries need to promote increased regional trade, especially through the removal of cross-border barriers and infrastructure bottlenecks. Since inward FDI inflows promote manufacturing development, to attract increased FDI to North Africa, high priority should be given to improvements in governance systems and the quality of human capital development. Efforts should be made to improve the efficiency and effectiveness of public institutions, while increasing investment in the quality of human capital so as to generate the requisite skills required in a competitive global environment. In addition, governments should respect private property rights, allow the rule of law to prevail, be accountable for their actions as well as improve the legal, judicial, and regulatory, and infrastructural environment.

Lastly, the promotion of effective liberal (not just electoral) democracy and prevent civil violence will help in the design of policies friendly to MVA development. This requires political will, commitment, good governance (including the control of corruption, transparency and accountability, the rule of law, government effectiveness, and political stability), inclusive development, collaborative spirit to formulate and faithfully implement the requisite policies, strategies, plans and collective action as well as the institutional changes needed for increased gender equality in education. Other critical measures to promote liberal democracy (contrary to the prevailing "anocracies") and check civil violence in North Africa include promoting and maintaining effective rule of law, deepening macroeconomic and structural reforms and increasing investments to raise national income, and implementing greater economic and political inclusion, especially in North Africa. Democracy will thrive and will be sustained and stable when there is the willingness to lose (contestation) and when there are capacities to challenge and enforce the rules of the game. Contestation means that parties are able to win but are willing to lose. In other words, opposition parties have to be able to compete effectively with incumbents, with the credible potential to hold incumbents accountable while voters and parties must be willing to lose elections. Also, laws must be effectively enforced. This means that a sturdy, thriving, durable and stable democracy requires a government with the capacity to enforce both the rules of the game and the policies produced through those rules against violation or nullification either by abusive agents of the government itself or by private actors, whether common criminals, would-be warlords or the military.

References

Anyanwu, J. C. (2014), "Oil Wealth, Ethno-Religious-Linguistic Fractionalization and Civil Wars in Africa: Cross-Country Evidence", *African Development Review*, Vol. 26, No. 2, 209–236.

Anyanwu, J. C. (2016), The Role of Human Capital in Manufacturing Value Added Development in Africa, Keynote Presentation at the PhD Prize Award Dinner of the 57th Annual Conference of the Nigerian Economic Society, Abuja, 27 September 2016.

Anyanwu, J. C. and Kponnou, M. (2016), Accelerating Agro-Manufacturing to Feed Africa, Paper Presented at the 2016 African Economic Conference, Transcorp Hilton, Abuja, 5-7 December 2016.

Bircan, C., Brück, T. and Vothknecht, M. (2010), Violent Conflict and Inequality, IZA Discussion Paper No. 4990, June.

Chenery, H. B. (1960), "Patterns of Industrial Growth", *The American Economic Review*, 50(4), 624-654.

Chenery, H. B., Robinson, S. and Syrquin, M. (1986), "Structural Transformation", In Chenery, H. B., Robinson, S. and Syrquin, M. (eds.), *Industrialization and Growth: A Comparative Study*, Oxford University Press, Oxford, pp. 11–12.

Chenery, H. and Syrquin, M. (1975), "Accumulation and Allocation Processes." In Chenery, H. and Syrquin, M. (eds.), *Patterns of Development: 1950-1970*, Oxford University Press, Washington, DC.

Chenery, H. B. and Taylor, L. (1968), "Development Patterns: Among Countries and over Time", *The Review of Economics and Statistics,* 50(4), pp. 391–416.

Dabla-Norris, E., Thomas, A., Garcia-Verdu, R. and Chen, Y. (2013), Benchmarking Structural Transformation Across the World, IMF Working Paper WP/13/176.

Dreher, A. (2006), "Does Globalization Affect Growth? Evidence from a new Index of Globalization", *Applied Economics*, 38, 10: 1091-1110.

Dreher, A., Gaston, N. and Pim Martens, P. (2008), *Measuring Globalization - Gauging its Consequence*, Springer, New York.

Echevarria, C. (1997), "Changes in Sectoral Composition Associated with Economic Growth," *International Economic Review*, Vol. 38, No. 2, Ma, pp. 431-452.

European Commission (2009a), *European Competitiveness Report 2008*, European Commission, Luxembourg.

European Commission (2009b), *Sectoral Growth Drivers and Competitiveness in the European Union*, European Commission, Luxembourg.

Gelb, A. (2010), Economic Diversification in Resource Rich Countries. https://pdfs.semanticscholar.org/7647/f5ddf65d0316d3ad967afe8e0480b30a4766.pdf

Haraguchi, N. (2016), "Patterns of manufacturing change and structural development" in Weiss, J. and Tribe, M. A. (eds), *Routledge Handbook of Industry and Development*, Routledge, Abingdon and New York.

Haraguchi, N. and Rezonja, G. (2010), *In Search of General Patterns of Manufacturing Development*, Development Policy and Strategic Research Branch Working Paper 02/2010, UNIDO, Vienna.

Haraguchi, N. and Rezonja, G. (2011a), *Emerging Patterns of Manufacturing Structural Change,* UNU-WIDER Working Paper 2011/43, UNU World Institute for Development Economics Research (UNU-WIDER), Helsinki.

Haraguchi, N., and Rezonja, G., (2011b), *Unravelling Manufacturing Development: The Role of Comparative Advantage, Productivity Growth and Country-specific Conditions*, UNIDO Development Policy, Statistics and Research Branch Working Paper, No. 16/2011, UNIDO, Vienna.

Haraguchi, N and Rezonja, G (2013,) "Emerging patterns of structural change in manufacturing", in Smirzai, A., Naude, W. and Alcorta, L. (eds), *Pathways to Industrialization in the Twenty First Century*, Oxford University Press, Oxford.

Haraguchi, N. and Rezonja, G. (2015), "Structural change in the BRICS' manufacturing industries", in Naude, W., Szirmai, A. and Haraguchi, N. (eds.), *Structural Change and Industrial Development in the BRICS*, Oxford University Press, Oxford.

Institute of Medicine (IOM) and National Research Council (NRC) (2015), *A framework for assessing effects of the food system,* The National Academies Press, Washington, DC.

Jaumotte, F., and Spatafora, N. (2007), Asia Rising: A Sectoral Perspective, IMF Working Paper WP/07/130, International Monetary Fund, Washington, DC.

Kaldor, N. (1967), *Strategic Factors in Economic Development*, Cornell University, Ithaca, New York.

Katz, J. (2000), "Structural Change and Labour Productivity Growth in Latin American Manufacturing Industries 1970-96", *World Development*, 28(9): 1583-1596.

Kochhar, K., Kumar, U., Rajan, R., Subramanian, A. and Tokatlidis, I. (2006), India's Pattern of Development: What Happened, What Follows? IMF Working Paper WP/02/22, International Monetary Fund, Washington, DC.

Kongsamut, P., Rebelo, S. and Xie, D. (2001), "Beyond Balanced Growth," *Review of Economic Studies*, Vol. 68, October, pp. 869-82

KPMG (2014), *Manufacturing in Africa*, KPMG Africa Limited, a Cayman Islands Company.

Kuznets, S (1971), *Economic Growth of Nations: Total Output and Production Structure*, Harvard University Press, Cambridge, Mass.

Lee, D. and Wolpin, K. I. (2006), "Intersectoral Labor Mobility and the Growth of the Service Sector," *Econometrica*, Vol. 74, Issue 1, pp. 1-46.

Lin, J. and Chang, H-J. (2009), "Should Industrial Policy in Developing Countries Conform to Comparative Advantage Or Defy it? A Debate between Justin Lin and Ha-Joon Chang", *Development Policy Review*, 27(5): 483-502.

Marshall, M. G., Gurr, T. R. and Jaggers, K. (2016), *Polity IV Project: Political Regime Characteristics and Transitions, 1800-2015*, Center for Systemic Peace, Vienna.

Matsuyama, K. (2008), "Structural Change," in The New Palgrave Dictionary of Economics, Second Edition, Durlauf, S. N. and Blume, L. E. (Eds.), Palgrave Macmillan, New York.

McKinsey Global Institute (2016), Lions on the Move II: Realizing the Potential of Africa's Economies, McKinsey & Company, Brussels, San Francisco & Shanghai, September.

McMillan, M., and Rodrik, D. (2011), "Globalization, structural change and productivity growth," Chapter 2 in Making Globalization Socially Sustainable, Bacchetta, M. and Jansen, M. (Eds.), International Labour Organization and World Trade Organization, Geneva.

Mensah et al (2016), "What Drives Structural Transformation in Sub-Saharan Africa?", *African Development Review*, Vol. 28, No.2, June, 157-169.

Mueller, J. and Stewart, G. (2011), Balancing the Risks, Benefits and Costs of Homeland Security, *Home Security Affairs Journal*, *7*.

Nickell, S., Redding, S. and Swaffield, J. (2008), "The Uneven Pace of Deindustrialisation in the OECD," *The World Economy*, Vol. 31, Issue 9, pp. 1154-1184.

OECD (2011), *OECD Due Diligence Guidances for Responsible Supply Chains of Minerals from Conflicted-Affected and High-Risk Areas*, Organisation for Economic Co-operation and Development, Paris.

Polity IV: Regime Authority Characteristics and Transitions Datasets, 1800-2015.
http://www.systemicpeace.org/inscrdata.html

Rodrik, D. (2011), *The Future of Economic Convergence*, NBER Working Paper Series, No. 17400, National Bureau of Economic Research.

Szirmai, A. (2009), Is Manufacturing Still the Main Engine of Growth in Developing Countries?, WIDER *Angle* newsletter, May.
http://epsusa.org/publications/newsletter/2009/july2009/mcdougal.pdf

Tkalec, M. and Vizek, M. (2009), "The Impact of Macroeconomic Policies on Manufacturing Production in Croatia", *Privredna kretanja i ekonomska politika* 121/2009, 61-92.

UNCTAD (2011), Economic Development in Africa Report 2011: Fostering Industrial Development in Africa in the New Global Environment, UNCTAD, Geneva, available at http://www.unctad.org/en/docs/aldcafrica2011_en.pdf.

UNCTAD (2013), The state of industrial development in Africa: unexploited opportunities amidst growing challenges, Policy Brief No.27, UNCTAD, Geneva, August.

United Nations Development Program (UNDP) (2012), *The Roles and Opportunities for the Private Sector in Africa's Agro-Food Industry: UNDP African Facility for Inclusive Markets*, UNDP, Johannesburg.

United Nations Industrial Development Organization (UNIDO) (2012), *Promoting Industrial Diversification in Resource Intensive Economies: The Experiences of Sub-Saharan Africa and Central Asia Regions*, UNIDO, Vienna.

United Nations Industrial Development Organization (UNIDO) (2013), *Industrial Development Report 2013. Sustaining Employment Growth: The Role of Manufacturing and Structural Change,* UNIDO, Vienna.

United Nations Industrial Development Organization (UNIDO) (2015), *Industrial Development Report 2016: The Role of Technology and Innovation in Inclusive and Sustainable Industrial Development*, UNIDO, Vienna.

World Economic Forum (WEF) (2012), *New Models for Addressing Supply Chain and Tranport Risk*, World Economic Forum, Geneva.

Weiss, J. (2011), *The Economics of Industrial Development*, Routledge, New York.

World Bank (2016), *World Development Indicators 2016*, World Bank, Washington, DC.