Is Manufacturing in Africa Constrained by Finance?

An Empirical Analysis of the Finance-Manufacturing Nexus

Richard E. Itaman

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Abstract

Financial development has often been seen as enhancing the growth of, yet having little effect on, the structural transformation of developing countries. We argue that financial development in African countries ought to be linked to the continent's most pressing need, which is its structural transformation, measured by growth in manufacturing. Given the divergence of finance from the manufacturing sector, we show that financial deepening in Africa exhibits weak linkages with productive activities. This weak linkage between the financial sector and productive investment is evident in the disproportionate flow of credit to households, services and the extractive sectors as finance expands. The consequence is financial fragility, as African countries are increasingly integrated into the global financial system, thereby exerting a negative effect on the structural transformation efforts of the continent. Using a group of 35 countries in the period 1960 to 2020, we employ the general method of moments (GMM) for panel data to examine the influence of finance on manufacturing in Africa. We estimate the non-monotonic relationship between finance and manufacturing and find a negative influence of finance at initial levels of development. At 55% of GDP, credit to the private sector starts to exert a positive effect on manufacturing in Africa. Therefore, our findings show that more directed finance is required for manufacturing growth in Africa.

Keywords: Industrial policy, Africa, Finance, Manufacturing

JEL codes: E24, Q54, I3, L52, J18

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1. Introduction

The long-standing argument underpinning the need for financial development is that access to finance has a binding constraint on growth. Financial markets are understood to reduce information and transaction costs, facilitate the trading of risks, allocate resources efficiently, monitor the activities of managers and exert corporate control, mobilise savings and facilitate the exchange of goods and services (Levine 1997). Finance is said to be even more binding than other factors of growth for small- and medium-scale enterprises in less-developed financial markets (Beck et al. 2005), as it allows small firms to expand and achieve larger equilibrium size by exploiting investment opportunities (Beck et al. 2006). Even with some acknowledgement of the destabilising potential of finance in the economy, proponents maintain that improved regulation and access to finance in developing countries will correct any tendency for misallocation (Ikhide 2015).

Despite the foregoing, there remains an increasing divergence between growth in finance and the real economy, both in advanced capitalist and developing economies (Dumenil and Levy 2004; Demir 2007), as finance has shifted towards speculative purposes in pursuit of much higher rates of profit (Tornell 1990). The gap between finance and productive investment also has become notably difficult to bridge (Storm 2018), as the flow of financial assets to sectors such as manufacturing continues to decrease (Demir 2007). In many African countries, finance is seen to flow disproportionately towards the extractive and services sectors, diverging increasingly from manufacturing (Itaman and Awopegba 2021), which is traditionally understood to be the engine of growth. The widening gap between productive and unproductive investment in the flow of finance is considered to be more detrimental for developing countries, which still have the urgent need to industrialise.

However, the effect of finance on development typically continues to be examined independently of the direction of flows, particularly outside of the economic structures of developing countries. The sheer expansion and diversification in the range of financial products, institutions and regulations are seen as sufficient for financial development to enhance development in Africa (Roe 2006). Given the urgent need for African countries to transform their economies structurally, it becomes necessary to consider how finance interacts with the economic transformation of these countries. This would entail understanding how financial development enables the upgrading of an economy from low-productivity, labour-intensive economic activities to high-productivity, capital-intensive activities, as labour increasingly migrates from agriculture and other primary sectors to higher productivity activities (Dasgupta and Singh 2006). At the onset is the extent to which financial flows correlate with or diverge from performance in the manufacturing sector. This is because manufacturing induces capital

accumulation through the agglomeration and economies of scale of industries, thereby generating positive externalities by way of economic linkages and technological spillovers (Kaldor 1970; Szirmai and Verspagen 2015).

Given the potential of manufacturing to raise competitiveness, productivity and incomes in Africa, it is imperative to understand the relationship between economic variables and manufacturing, and not least financial development. We analyse the influence of finance on manufacturing in sub-Saharan African countries, using panel data and dynamic panel techniques to estimate the relationship between finance and manufacturing growth. We employ the general method of moments (GMM) system estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998) to estimate the panel data. We further estimate the threshold or trigger point from which finance starts to exert a negative effect on manufacturing in African countries and find a negative impact at initial levels of development At 55% of GDP, credit to the private sector starts to exert a positive effect on manufacturing.

An analysis of financial development in Africa is essential, including of the threshold at which it potentially exerts a negative effect, given the narrative of more finance for development, with the lack thereof being viewed as underpinning the absence of structural transformation. Such analysis is in line with the increasing recognition of the detrimental effects of financial development on economic development after a certain threshold (Arcand et al. 2015). Previously, the literature emphasised broadly how large financial sectors stimulate the growth of industries dependent on external finance (Rajan and Zingales 1998). On the other hand, the potential of financial liberalisation to trigger a decline in manufacturing is high, especially for developing countries (Palma 2008). We build on these two strands of literature, bringing them together. In examining the point at which finance may exert a negative effect on growth in Africa, we aim to enable policy to conciliate the negative effects of finance on development, while regulating the activities of financial institutions towards more productive investments in the region.

We discuss the theoretical literature underpinning the relationship between finance and growth in the section that follows, including the threshold analysis, with an attempt to make a link between finance and manufacturing. This is followed by an exploration of the increasing level of financial development in Africa, along with its broader impact. We discuss the literature on manufacturing in Africa and the challenges to its structural transformation. The finance-manufacturing nexus in Africa is examined as a prelude to the empirical estimation that follows.

2. Finance and Development

The literature on the contribution of finance to development emphasises the critical role of the financial sector in the industrial revolution in England through capital mobilisation for factories (Bagehot 1873). The financial sector was said to identify and fund entrepreneurs with potential for innovation that will increase productivity (Schumpeter, 1911). For countries to catch up also required that financial institutions fund new activities (Gerschenkron 1952). Therefore, financial development was said to stimulate real investment, which leads to growth. Goldsmith (1969) used financial intermediation assets as a share of output for 35 countries over a 100-year period from 1860 to 1963 to show the positive influence of finance on growth. Jung (1986) later found evidence to support the positive influence of financial development on economic growth for both low- and high-income countries. These findings, together with subsequent studies, led to a consensus on the positive role financial markets and institutions play in the growth process and as a predictor of future developments and technological innovation (King and Levine 1993; Rajan and Zingales 1998; Beck et al. 2000; Levine et al. 2000). Later, attempts were made to differentiate between how different forms of finance, and the size and levels of financial markets, affect growth (Levine and Zervos 1998; Levine 2005).

On the other hand, some studies have noted that growth in the productive sectors of the economy would require corresponding financial sector investment to meet the resultant demand for growing economic activities and increasing levels of production (Robinson 1952). As such, it is not financial sector development that leads to growth, but vice versa. Chandler (1977) provided evidence for this argument by showing that the growth of the financial sector in the United States in the nineteenth century, comprising investment banks and the corporate bond market, emerged to meet the financing needs of the transport sector, such as railroads.

3. The Threshold Analysis of the Finance-growth Nexus

Some studies started to show that the relationship between finance and growth might be non-linear and not absolutely positive (Ramey and Ramey 1995; Easterly et al. 2000; Khan et al. 2001; Deidda and Fattouh 2002; Rousseau and Wachtel 2002; Rioja and Valev 2004; Shen and Lee 2006; Cerra and Saxena 2008; Rousseau and Yilmazkuday 2009), allegedly contingent on a range of factors specific to individual country levels and conditions of development. These findings were stifled in pursuit of evidence to support a positive role of finance for growth. This continued until the 2008 financial crisis, which showed the detrimental effects that the financial sector can have on development. The negative influence of finance on growth was ascribed to poor risk-management practices in financial institutions, excessive debt leveraging, increasingly complex financial products and weak regulation, not least in underwriting standards for mortgage

contracts that undermined the flow of finance to productive investments. It led to the consensus that finance contributes to growth only up to a certain point, beyond which it starts to exert a negative effect on growth or shifts from positive to negative, or vice versa, in relation to development (Ductor and Grechyna 2011; Hassan et al. 2011; Yilmazkuday 2011; Barajas et al. 2012; Cecchetti and Kharroubi 2012; Pagano 2012; Yu et al. 2012; Law and Singh 2014; Arcand et al. 2015).

The threshold at which the marginal effect of financial development on growth becomes negative is found to be when credit to the private sector reaches 80% to 100% of GDP per capita (Arcand et al. 2015). The IMF found a threshold of 70% of GDP per capita (International Monetary Fund [IMF] 2015). These findings are similar to the threshold at which Ramey and Ramey (1995) and Cerra and Saxena (2008) find that financial development starts to cause volatility in the economy. Threshold analyses control for macroeconomic volatility and banking crises and show that the non-linear relationship between finance and growth is not driven entirely by crises and volatility (Kaminsky and Reinhart 1999; Easterly et al. 2000; Rousseau and Wachtel 2011; Schularick and Taylor 2012). Instead, the relationship between finance and growth is found to be consistently non-linear, irrespective of volatility and crises, or other heterogeneous factors such as the absence of functioning institutions. Arcand et al. (2015) explain this fundamental change in the influence of finance on development by revisiting Minsky's (1974) financial volatility hypothesis, which shows excessive pursuit of risky investments in periods of economic prosperity. They also draw from Tobin's (1984) financial sector suboptimal allocation of talents to explain the negative influence of finance, which shows that the financial system outgrows the real economy and attracts more talent, to the detriment of other, more productive sectors.

4. Financial Development in Africa

Analyses of financial development in low-income countries can be traced back to McKinnon (1973) and Shaw (1973), who argued in their financial repression hypothesis that regulated interest rates helped cause low growth and savings in developing countries. Interest rate liberalisation was proposed to spur savings and growth, with the real rate of interest said to adjust to an equilibrium level that enhances efficiency. An increase in the real rate of interest would cause an increase in savings and the total real supply of credit, inducing a higher volume of investment. Higher investment would then lead to growth as the average productivity of capital increases, with financial markets said to increase efficiency through cost reduction, non-interest income and profit as foreign banks enter developing countries (Claessens et al. 2001). However, savings were found to be non-responsive to interest rates in developing countries (Giovanni 1985), and particularly for poor households (Ostry and Reinhard 1992). Studies have

also found that, besides an increase in growth, income distribution was necessary for a positive influence of financial development on poverty (Jalilian and Kirkpatrick 2002).

For African countries, the relationship between finance and growth has often been found to be positive. This is mostly premised on the consensus regarding the potentially positive role of finance to foster growth in developing countries, with reservations only around the regulatory environment. Consequently, the financial sector across Africa has experienced significant growth in the last three decades, characterised by an increase in financial inflows, growth of regional banks, expansion of commercial bank branches and cash machines, expansion of capital markets and instruments, and a rise in microcredit and mobile payment systems (Allen et al. 2012). Financial development in Africa has deepened, as countries continuously set financial development targets in the aspiration towards middle-income levels. The financial systems landscape in Africa is also very diverse, ranging from well-developed systems in middle-income countries such as South Africa, to underdeveloped financial markets in countries such as Sudan and Central Africa Republic (Beck and Cull 2014b). At the firm and household levels, most African countries have small, shallow and costly financial institutions (Beck and Cull 2014a). Banking penetration measured by access to checking accounts remains significantly low in Africa, with the exception of South Africa (Beck et al. 2009).

Research is as inconclusive on the finance-growth nexus in Africa as it is on other regions. Nevertheless, most studies find a positive long-run relationship (Odedokun 1989; Agu and Chukwu 2009; Lee and Chang 2009; Bangake and Eggoh 2011; Hassan et al. 2011), while other studies acknowledge that evidence is unclear on the positive nexus in Africa (Murinde 2012). Atindehou et al. (2005) investigated the relationship between financial development and economic growth for West African countries and found an insignificant relationship, with credit by banks and other financial institutions showing no positive influence on growth. Ghirmay (2004) found evidence that finance causes growth in twelve African countries. Likewise, Gries et al. (2009) and Akinlo and Egbetunde (2010) found a unidirectional relationship in which finance caused growth. On the other hand, Odhiambo (2008a) and Hassan et al. (2011) found the direction of causality to be from growth to finance. Abu-Bader and Abu-Qarn (2008), Odhiambo (2008b), Lee and Change (2009) and Ahmed (2010) found bi-directional causality. These studies mostly employed the VAR vector error-correction (VECM) model. What is more, in the light of the recent threshold analysis, Ikhide (2015) employed the dynamic panel data approach for a cross-country analysis of 21 sub-Saharan African countries between the period 1970 and 2013. Using a multiple equilibria model, he found a decline in the effect of increasing financial development on growth in Africa in the post-2005 period. Financial development was also found to exert a negative effect on growth in Africa before 1980, with a positive influence between 1980 and 2005.

Nevertheless, the surge in financial development in sub-Saharan Africa has been marked by an increase in the percentage of credit to GDP advanced by banks and other financial institutions in Benin, Malawi, Mali, Niger, Nigeria, Sao Tome and Principe, Sierra Leone, Swaziland, Sudan, Tanzania, and Uganda. According to Griffith-Jones and Karwowski (2013), the percentage of credit to GDP even exceeds the 0.7 IMF threshold for a negative relationship between finance and growth in Mauritius, Namibia, Seychelles, South Africa and Tunisia. Interestingly, credit is comprised mostly of household consumption and mortgage. For example, the housing boom in South Africa – with one of the highest real price gains in the housing market globally, and where the ratio of household to business credit is approximately 1:1 – between 2000 and 2010 was driven by a increase of over 500% in the real price of housing loans. A similar case obtains in Mauritius, where, according to a 2012 survey, one third of private credit was allocated to households, 60% of which was towards mortgage finance and 40% towards consumption. Even in low-income sub-Saharan African countries such as Mozambique, private credit increased from 15% to 23% of GDP between 2000 and 2010.

Credit to GDP doubled in Benin Republic and Swaziland, increased by between 300% and 1 000% in Malawi, Mali, Niger, Nigeria, São Tomé and Príncipe, Sierra Leone, Sudan, Tanzania and Uganda, and by 1 500% in Angola (Griffith-Jones and Karwowski, 2013). Yet the cost of delivering financial services in sub-Saharan Africa remains relatively high, and eligibility to access financial services remains stringent, consisting of formal identification for opening an account, which is absent in a predominantly informal environment. Also, the financial sector is characterised by higher interest rate spreads between savers and borrowers than other regions, with very low interest rates for the former and very high interest rates for the latter.

Analyses of financial development in Africa seem removed from addressing the source of the relatively higher cost. Prominent reasons include the lack of infrastructure as electricity, transportation, communication. The high cost also derives from the pressure of external finance seeking to make a profit and exerting upward pressure on interest rates. These factors reinforce the need to ensure the linkage between finance and the productive sectors, not least manufacturing. Even the ratio of private credit to GDP remains relatively low in comparison to other developing countries (Allen et al. 2012), making finance inaccessible to MSMEs which make up a significant proportion of firms in African countries. Ikhide (2015) notes that financial development in Africa has not been accompanied by an increase in loan disbursement. Also, Beck et al. (2006) identify a lack of appropriate financial services designed to fit the needs of SMEs as a major constraint, with emphasis placed on improvements in resource allocation for the productivity growth of industries (Beck et al. 2009). Sub-Saharan African banks disburse fewer loans than banks in any other region of the world, although with large variation across countries on the continent, ranging from 3% of firms in Guinea-Bissau to 53% in Mauritius (Beck and Cull

2014b). While African countries lag behind other middle-income countries in measures such as liquid liability to GDP, private credit to GDP and the number of accounts in formal financial institutions, they have outperformed other regions in the penetration of household debt through mobile money (see Table 1), another marker of a distinct type of financial development in the region, although not without attendant implications.

Table 1: Differences in Financial Development Variables for Africa, and Other Middle- and Low-income Economies (East Europe and Central Asia)

	Africa		Other middle- and low-income economies	
Financial development variables	Mean (%)	Standard deviation (%)	Mean (%)	Standard deviation (%)
Liquid liabilities/GDP	31.8	16.8	55.4	32.7
Private credit/GDP	19.4	16.9	40.0	24.7
Account at formal financial institution	21.0	16.3	35.2	21.5
Loan from a financial institution	5.2	3.2	10.1	6.1
Mobile phone used to send money	8.8	13.2	2.3	4.1
Mobile phone used to receive money	11.9	15.3	3.5	6.1
Mobile phone used to pay bills	3.3	5.1	2.5	4.4

Source: Allen et al. (2012)

Despite increasing financial development in Africa, evidence shows that poverty and inequality remain persistently high. More poor people live in Africa today than in 1990, and seven of the ten most unequal countries in the world are in Africa (Beegle et al. 2016). Even the alleged success story of microfinance in Africa is not what its proponents have claimed it to be, as poor borrowers have been burdened with domestic debt from microfinance (Kaboski and Townsend 2011; Chang and Bateman 2012; Bateman 2014; Banerjee et al. 2015). It reinforces the argument that analyses of the effect of finance on growth in Africa have been removed from its development, ignoring context-specific needs and the structural challenges in these countries.

From the foregoing, there is no sufficient evidence to affirm that proximity to financial institutions has the potential to elicit positive outcomes for the poor in Africa or, because loans have been disbursed in rural areas, they have certainly gone to the poor and are beneficial to improving their livelihoods (see, for example, Roe 2006; Beck and Cull 2014a). A 2017 global

survey conducted by the World Bank showed that 59% of adults without bank accounts do not have the income to maintain one (World Bank 2017). Such financial exclusion is worse for manufacturing, taken up below. Even the celebrated success of mobile banking in Africa (Allen et al. 2012) cannot be ascribed to any factor other than the lack of infrastructure across the continent. Vulnerability around financial development in Africa is evident in the 2008 global financial crises through trade, remittances and Overseas Development Assistance (ODAs), with a 0.7 percentage fall in GDP growth in the two years that followed the crisis, and a fall in taxes collected of 1.7% of GDP compared to pre-crisis levels. This led to an average 1% budget deficit across the continent, and a 1.5 percentage fall in gross capital formation as a share of GDP in the year after the crisis (Griffith-Jones and Karwowski 2013).

5. Manufacturing and Development

The theoretical case for the positive relationship between manufacturing and growth can be found in the work of Kaldor (1966), which have been summarised into three laws: (1) The faster the growth of manufacturing output, the faster the growth of total output. (2) There is a strong positive relationship between the growth of manufacturing output and the growth of manufacturing productivity. (3) The faster the growth of manufacturing, the faster productivity outside of manufacturing will grow (Felipe 2010). Empirical evidence was provided to support these propositions for high-income economies by Cripps and Tarling (1973). The results were also found to be positive and statistically significant for 50 developing countries for which data was available in the period 1990 to 2000 (Dasgupta and Singh 2006).

From the foregoing, the place of manufacturing in development can hardly be overemphasised due to its long-run productivity gains and unconditional convergence of labour productivity through dynamic, increasing returns to scale (Prebisch 1962; Kaldor 1970; Weiss 1990; Hirschman 1992). The role of manufacturing in creating more linkages than other sectors is well known (Hirschman 1958). Historically, manufacturing has also been best suited to wage bargaining (Rowthorn and Ramaswamy 1997) and a safeguard of employment (Rodrik 2013) when labour migrates from agriculture and low productivity to higher productivity activities (Dasgupta and Singh 2006). As such, the manufacturing industry becomes critical for countries at low levels of income per capita due to the potential for technical change, learning effects, productivity growth, linkages and tradeable activities for exports (Weiss and Jalilian 2016), which African countries are in dire need of for their structural transformation.

Given that manufacturing has high employment effects, it becomes an important source of income for the poor and low-skilled labour force in developing countries. However, the share of employment in manufacturing may be lower than the share of value added in manufacturing due

to its relatively high productivity, with the potential to increasingly displace labour at higher levels of technological capability. There is a tendency for manufacturing to be located in areas with relatively lower labour costs. These challenges require an industrial policy for sustaining manufacturing and raising its relative profitability. Indeed, the literature has evolved from factors that lead to structural transformation, through manufacturing, technical change and institutions as emphases, to understanding policy efforts and the domestic and international politics of industrialisation, including how ownership structures and distribution sustain the demand required for industrialisation or undermine its gains (Itaman and Wolf 2021).

6. Manufacturing in Africa

Initial attempts at developing manufacturing in African countries were through import-substitution industrialisation (ISI) strategies in the immediate post-colonial period of the 1960s and 1970s, as development policy was hinged on structural transformation. Efforts were made to substitute imported manufactured goods with locally produced goods in domestic markets by first manufacturing intermediate inputs with the aim of upgrading to capital goods. Many African countries achieved modest levels of industrialisation by manufacturing low-value consumer and intermediate goods. Specialisation in primary goods from the 1980s saw African countries experience a decline in their export earnings, with adverse effects for their balance of payments and macroeconomic stability (Deaton and Miller 1995).

Manufacturing value added has been declining in sub-Saharan African countries by about 1% per annum since the 1980s, and into the 1990s (Stewart et al. 1992). Over the last 40 years, its share in world manufacturing fluctuated between 0.5% and 1%, with the share of manufacturing exports in Africa's total exports rising from approximately 10% to 30%, which is a reflection of the decline in the export of primary products, rather than a real increase in the value of manufacturing exports (Lawrence 2016). The manufacturing sector has been dominated by low-value production of food, beverages, tobacco, textile, clothing, wood, metals and oil (Tribe 2002), with a shift to more durable and capital goods in a few countries, such as South Africa (Lawrence 2016). On the other hand, import has been dominated by capital goods and higher value consumer goods as trade between African countries and the rest of the world becomes more liberalised.

Table 2 shows that only two African countries, Algeria and Eswatini, have maintained higher than 25% of manufacturing value added (MVA) in the last 30 to 40 years. MVA fluctuated around 15% for many African countries between 1970 and 2020, with most of them recording a decline in the last 10 years. Only Uganda maintained increasing manufacturing between 1970 and 2020, recording an increase in MVA of over 70% in the last decade. Guinea, Ghana, Congo Republic,

Central African Republic and Angola have experienced a marginal increase in the last decade. Other African countries saw their MVA as a percentage of GDP declined significantly between 2011 and 2020, including countries where industrial policies have been pursued to intensify manufacturing. The available data shows that the number of workers employed in manufacturing in Africa, captured by employment in manufacturing as a percentage of total employment in Table 3, shows that only about 29% of countries in Africa recorded significant growth in employment between 1991 and 2020.

Table 2: Manufacturing, Value Added (% of GDP) for African Countries

Country name	1971-1980	1981-1990	1991-2000	2001-2010	2011-2020
Algeria	-	-	40.10	43.50	28.87
Angola	-	-	3.97	4.03	5.28
Benin	10.45	7.79	9.05	14.29	10.21
Botswana	5.87	5.47	5.29	5.81	5.47
Burkina Faso	17.16	14.63	14.27	14.09	10.58
Burundi	8.34	9.08	9.59	10.62	9.31
Cabo Verde	-	8.88	11.80	6.02	6.27
Cameroon	9.57	12.05	16.92	15.34	14.67
Central African Republic	-	-	-	18.85	19.44
Chad	11.24	11.66	10.23	3.53	2.70
Congo, Democratic Republic	-	-	5.99	17.59	17.60
Congo, Republic of	8.43	6.92	6.88	5.76	7.41
Cote d'Ivoire	9.34	17.45	16.02	13.88	12.67
Djibouti	-	-	-	-	2.77
Egypt, Arab Republic of	14.42	14.54	16.55	16.56	16.36
Equatorial Guinea	-	-	-	16.21	21.05
Eritrea	-	-	8.40	7.34	-
Eswatini	18.89	21.31	32.04	34.08	30.14
Ethiopia	-	4.57	4.85	4.87	4.78
Gabon	5.36	6.28	5.04	9.82	23.51
Gambia, The	3.46	5.98	8.01	5.93	5.33
Ghana	10.73	8.17	9.11	8.35	9.91
Guinea	-	4.55	3.98	8.39	10.29
Guinea-Bissau	-	8.71	6.76	12.13	11.25
Kenya	10.63	10.26	10.04	11.06	9.50
Lesotho	5.22	7.95	9.94	20.66	14.36
Liberia	-	-	2.45	3.11	2.00
Malawi	11.94	13.72	14.08	11.63	10.26
Mali	6.18	-	-	6.73	6.20
Mauritania	-	9.97	8.15	8.95	6.90
Mauritius	12.95	17.34	20.35	16.72	12.53

Morocco	16.85	19.41	18.55	16.33	15.56
Mozambique	-	-	12.87	12.94	8.59
Namibia	8.49	9.81	9.56	11.40	11.69
Niger	5.04	6.48	9.51	8.18	7.51
Nigeria	-	19.74	18.24	9.85	9.41
Rwanda	9.87	13.80	12.19	8.65	7.64
Sao Tome and Principe	-	-	-	6.88	6.84
Senegal	-	-	20.43	19.01	16.46
Seychelles	6.13	9.48	13.40	11.27	6.71
Sierra Leone	5.33	5.11	6.24	2.65	1.88
Somalia	5.91	4.69	-	-	-
South Africa	20.60	21.31	18.92	15.57	11.85
South Sudan	-	-	-	2.26	3.00
Sudan	6.04	7.78	6.95	6.54	-
Tanzania	-	8.48	8.04	9.01	8.56
Togo	7.27	7.64	8.93	7.73	10.50
Tunisia	10.20	14.86	17.26	16.52	15.44
Uganda	5.98	5.31	6.83	8.97	16.09
Zambia	15.38	24.15	16.19	9.15	7.17
Zimbabwe	19.43	20.16	18.39	13.49	11.11

Source: World Bank Development Indicators (2021)

Table 3: Employment in Manufacturing % of Total Employment for Selected African Countries

Country	1991-2000	2001-2010	2011-2018
Botswana	7.146194	5.499392	3.767016
Burkina Faso	2.615471	2.969687	9.156654
Egypt	12.94793	12.09305	11.78549
Ethiopia	2.678024	5.112282	8.642395
Kenya	7.960057	12.19236	13.37213
Lesotho	6.339319	11.21948	11.47628
Mauritius	29.06448	23.17363	17.12895
Morocco	14.30358	12.60645	10.98628
Namibia	6.210982	5.445011	5.301369
Nigeria	7.438819	4.414714	5.990618
Senegal	6.96389	9.822124	13.13964
South Africa	12.18072	12.8991	10.07663
Tunisia	17.88612	17.31824	16.54378
Uganda	6.656896	5.695261	4.94766

Source: GGDC 10-sector database (2021)

We have noted elsewhere the more recent near-consensus that the decline in manufacturing in African countries is underpinned by the market liberalisation policies of the 1980s and the abandonment of industrial policy by the state (Itaman and Awopegba 2021). This resonates with the study of Stein (1992), which highlights the limitations of the model of industrial adjustment that located production in Africa in the agricultural sector. An initial review of this decline in manufacturing was alluded to in the macroeconomic policies, not least in import quotas and protection against competition, and the overvalued exchange rate (Biggs and Srivastavia 1996), with recommendations concerning mainly market liberalisation, pricing and exchange rate devaluation. However, this initial understanding ignored the structural difficulties around technological upgrading and the skills gap, inadequate infrastructure, lack of access to finance and, most significantly, the difficulties faced by African countries in traversing global value chains.

In a study by Jalilian and Weiss (2000), African countries were shown to have experienced a decline in both absolute real manufacturing output and the share of manufacturing in GDP. Using cross-country estimations, they showed a lower than predicted share of manufacturing in total output and a size of manufacturing lower than their predicted potential based on country-specific characteristics, with these deviations from the predicted share and size growing over time. Also, they found the size of manufacturing in Africa to be a function of income per capita, population, trade policy and natural resource rent, factors that are peculiar markers of African economies. Empirical evidence of declining manufacturing output and employment share in manufacturing in African countries is also provided by Noorbakhish and Paloni (1999), who emphasise lack of finance, technological transfer and economic diversification as underpinning the decline. This re-emphasises the narrative for industrial policy to incorporate finance and the above-mentioned factors for success.

The decline in manufacturing in African countries is notably being experienced at lower levels of per capita income (Tregenna 2011), without a shift to higher value consumer and capital goods – as was the expectation in the adoption of industrial policies in the post-colonial era. This decline has been attributed to the abandonment of industrial policies from the 1980s (Stein 1982; Mkandawire and Soludo 1999), which should have strengthened the productive capabilities of firms in these countries. Declining manufacturing and re-focusing on primary commodities in these countries has made them more vulnerable to external price and demand shocks (Jalilian and Weiss 2000; Dasgupta and Singh 2006). Employing a censored regression model using firm-level data from the World Bank Enterprise Survey across 29 African countries, Avenyo et al. (2021) found that low technological and production capabilities underpin the poor export performance of firms in manufactured goods across African countries. Given challenges with manufacturing in Africa, it is vital to address the constraints on technological and capabilities upgrading, not least the levels and types of financial development necessary for enhancing

manufacturing and realising its potential for development on the continent. This is taken up below.

7. The Finance-manufacturing Nexus

The literature on the positive role of finance in development has generally overlooked the influence of finance on manufacturing as a marker of structural transformation. Historically, banks and other financial institutions have been found to fund industries, and not least manufacturing, for successful structural transformation (Gerschenkron 1952; Hall and Soskice 2001). This was evident in how German banks funded industries such as manufacturing in the country's post-war reconstruction (Burhop 2006), and how the financial sector in East Asia was compelled by the state towards industries (Yeung 2016). However, since the 1980s, investments have shifted towards financial assets in pursuit of much higher rates of profit (Demir 2007; Tornell 1990), to the detriment of manufacturing.

Some studies underscore the effect of the divergence of finance from the manufacturing sector. Using firm-level data from nationally representative surveys of the Indian informal sector, Raj and Sen (2014) found that finance constraints act as a significant impediment to firm transition in the informal sector at the firm and district level. In a study of 77 developing countries over the period 1984 to 2013, Daway-Ducanes and Gochoco-Bautista (2019) used the two-step generalised method of moments approach to explore the relationship between financial development and growth in manufacturing and services, and whether financial sector size plays a role in manufacturing growth. They found a U-shaped relationship between financial development and manufacturing, with finance showing potential for a long-run negative effect for 50% to 90% of the countries in their sample. We build on these studies below to understand the relationship between financial development and manufacturing in Africa.

8. The Finance-manufacturing Nexus in Africa

The ISI agenda of immediate post-colonial Africa, which matched countries' consumer and intermediate import patterns, brought to the fore the need for foreign currency or FDI to meet local manufacturing, with the dominant financial arrangement in the ISIs taking the form of loans. Foreign partners found this arrangement attractive, since African governments offered investors protection against competition and guaranteed loan repayment, while taking on the majority shareholding (Lawrence 2016). But this further increased the governments' dependence on foreign funding, which was insufficient, made worse by the easy outflow of capital. From this point on, manufacturing in Africa became marked by inadequate finance (Lawrence 2016). The

lack of financial investment in African countries has been found to be a main driver of the decline in manufacturing (Noorbakhish and Paloni 1999).

In a survey of sub-Saharan African countries, underdeveloped financial markets were found to constrain access to credit by manufacturing firms, with 82% percent of these firms not applying for loans due to the cumbersome application process, inadequate collateral and lack of confidence of securing one (Bigsten et al. 2003). Under-development in the financial sector, and the constraints it creates for funding, could undermine the potential for innovation in manufacturing, as in Schumpeter (1911). On the other hand, poor performance in industrialisation in Africa and low income could underpin the underdevelopment of financial markets in Africa, going by the argument that enterprise development leads financial development (Robinson 1957). Either way, there is a dissonance between financial development and manufacturing in Africa.

We argue that analyses of the influence of financial development in Africa need to further take into consideration its relationship with manufacturing as a marker of structural transformation. This is because financial investment in manufacturing has the potential to raise productivity, with spillover effects to other sectors, thereby exceeding the sum of returns to investment in individual sectors (Nurkse 1953) and causing a structural transformation. A similar argument can be found in Hirschman (1958), who says financial investment in targeted sectors with high linkages could accelerate industrialisation for development. This argument was expanded in the Big Push theory, which emphasises the importance of domestic and foreign financial investment to stimulate technology and skills in late developers (see Rosenstein-Rodan 1943). This prominent role of manufacturing in development has a significant bearing on Africa's structural transformation, given its large agrarian sector and attendant constraints.

Research underscores the link between finance and manufacturing, not least around the systematic de-linking of finance from the manufacturing sector (Bluestone and Harrison 1982), including disproportionate financial flows to the extractive sectors in pursuit of short-term resource rent by banks at the expense of manufacturing (Itaman and Awopegba 2021). Lower sectorial allocation of finance to manufacturing has been found to be causal for the decline in manufacturing (Rowthorn and Coutts 2004). The flow of finance, in turn, shapes the economic structures of African countries away from manufacturing. As a result, the economic structures of African countries remain unconducive "to increasing domestic value addition and to sustained industrial and technological upgrading (Andreoni and Tregenna 2020: 324).

Given the need for technological upgrading in Africa, with manufacturing as a marker of development, we aimed to understand the relationship between finance and manufacturing,

including the threshold effect. This would build on the threshold study of Ikhide (2015), which finds a declining influence of finance on growth in African countries from 2005.

9. Empirical Estimation

9.1 Empirical Model

The factors that drive growth in manufacturing, as indicated in the literature, are income growth, trade openness, productivity growth, and low investment in manufacturing proxied by foreign direct investment and occasionally by finance (Rowthorn and Ramswamy 1997; Jalilian and Weiss 2000; Rodrik 2016; Tregenna 2016). The size of domestic markets is often captured by population size (Rodrik 2016).

9.2 Data Analysis

The data used in the estimations was obtained from the World Bank Development Indicators (WDI). Two dependent variables were explored, namely manufacturing value added (MVA) as a percentage of GDP (constant prices), which captures growth in manufacturing and employment in manufacturing (MEMP) as a percentage of total employment. The independent variable of interest is domestic credit to the private sector by banks (or financial sector) as a percentage of GDP and its square term to measure the threshold effect (Arcand et al. 2015). The control variables are the standard factors that drive industrial (manufacturing) growth, namely gross domestic product per capita and its square term, which are used in the literature to denote the inverted-U relationship between income and manufacturing; trade (% of GDP); foreign direct investment net inflows (% of GDP); and total population. We exclude employment in manufacturing, as well as productivity growth variables, from our regressions due to data challenges for African countries. The summary statistics and data description of our sample data are shown in Table A.1 and Table A.2 respectively.

9.2.1 Model Specification

We use panel data and dynamic panel techniques to estimate the relationship between finance and manufacturing growth in sub-Saharan Africa. The panel data consists of 35 SSA countries over the 60-year period from 1960 to 2020. We explore the time variation of the panel sample, following Beck et al. (2000) and Arcand et al. (2015), by splitting the data into non-overlapping five-year periods.

The empirical model specification is given as:

$$LMVA_{it} = \alpha LMVA_{it-1} + \delta Z'_{it} + \beta X'_{it} + \mu_{it} + \varphi_{it} + \varepsilon_{it}, \quad (1)$$

where LMVA is the log of manufacturing value added; LMVAt-1 is the log of the lagged manufacturing value added; Z' represents a vector of variables representing financial depth (the log of credit to the private sector by banks, the level of credit to the private sector by banks, and the square of credit to the private sector by banks); X' is a vector of control variables; μ is the unobserved country-specific effects; φ is the time-specific effect; α, δ, β are parameters; i is the number of cross-sections; t is the five-year time period; and ε is the error term. In this model specification, the lagged log of manufacturing value added is the endogenous variables, while the others (Z' and X') are treated as strictly exogenous.

9.2.2 Estimation Technique

We adopted the general method of moments (GMM) system estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998) to estimate the panel data model. The advantage of the system GMM over OLS is that it addresses the endogeneity and omitted variable bias, measurement error and country-specific heterogeneity. Two specification tests assess the consistency of system GMM. The first test examines the null hypothesis that the error term is not serially correlated (AR2), and the second – the Hansen test of over-identifying restrictions (IID) – tests for the overall validity of the instruments. If we fail to reject both null hypotheses, then the model is considered consistent.

However, a plausible problem associated with GMM estimations is “instrument proliferation” (Roodman 2009b). The inclusion of too many instruments in our model can overfit the endogenous variables, whereby endogeneity can persist. In turn, overfitting can cause the overidentifying test of the instruments’ joint validity (i.e. Hansen test) to detect this problem (Bowsher 2002). To overcome the instrument-proliferation problem, we adopted an instrument-reducing strategy known as “collapsing”, which combines instruments into smaller sets (Roodman 2009a).

Missing data or gaps in panel data were a prominent feature of our dataset on sub-Saharan African countries. This can have serious consequences, such as misleading or insignificant results. To combat this challenge, we excluded 19 countries from the initial sample of 54 SSA countries, leaving the estimation sample with 35 countries. The description of countries is found in the Appendix. In addition, we adopted the “orthogonal deviations” method (instead of first-differences) by Arellano and Bover (1995), which expresses each observation as the deviation from the average of future observations. This method mitigates data loss for panels with gaps, thereby maximising sample size (Roodman 2009b). Therefore, given the limitations of our sample data, we explored the orthogonal deviations method. Lastly, the Windmeijer (2005) finite sample correction was used to obtain robust standard errors.

10. Empirical Results

The first six (1 to 6) columns of Table 4 measure financial depth using the log of credit to the private sector by banks, while the next six columns (7 to 12) use the level of credit to the private sector provided by banks. All the regressions include the time-specific effects (dummies), the lagged dependent variable as well as the control variables: GDP per capita and GDP per capita squared, trade openness, foreign direct investment inflows over GDP, and population. At the bottom of the tables, the standard specification tests are reported and, as shown, all our models do not reject the null of no second-order autocorrelation (AR2). Moreover, the null of the Hansen overidentifying restrictions (OID) test was rarely rejected (except in the first regression for each specification), depicting the joint validity of our instruments.

The model estimated for the periods 1960 to 1995, as shown in the first column of Table 4, indicates the presence of a positive but statistically insignificant correlation between the log of financial depth and manufacturing. In column 2, the model is estimated for the period 1960 to 2000; however, the coefficient is now negative and remains statistically insignificant. The negative correlation between financial depth and manufacturing persists even for estimations using more recent data up to 2020, except for the estimation for the periods 1960 to 2005. The evidence of a persistent pattern of negative correlation between financial depth and manufacturing is corroborated by the other models (columns 8 to 12) with corresponding time periods when using the level of credit to the private sector by banks to depict financial depth. We observe that, in our models, only the lagged dependent variable is statistically significant, until much more recent data is used (i.e. estimations for periods 1960 to 2015/2020). Notably, the coefficient of the level of financial depth is negative and statistically significant for the last two non-overlapping time periods (1960 to 2015/2020).

To explore the “too-much” finance hypothesis for manufacturing, we augmented the model of the last six columns of Table 4 with the square of the level of financial depth in Table 5. Similar to the pattern shown in Table 4, the linear and quadratic terms are only significant for estimations over the periods 1960 to 2015/2020. The coefficient of the level of financial depth shows an increasingly negative correlation with manufacturing, while that of the square of financial depth depicts an increasingly positive correlation with manufacturing. Based on the point estimate of the regressions shown in column 1 of Table 5, using data for period 1960 to 1995, we infer that the positive marginal effect of financial depth on manufacturing becomes negative when credit to the private sector reaches 117% of GDP (see last row of Table 5). Adding more recent data (i.e. using data for the period 1960 to 2000, column 2), the marginal effect of financial depth remains negative for virtually all levels of credit to the private sector. Introducing more recent data (for the period 1960 to 2005, column 3) reverses this effect, as the negative marginal effect of

financial depth becomes positive when credit to the private sector reaches 36% of GDP. Using more recent data gradually increases the threshold to 51%, 53% and 55% respectively for the periods 1960 to 2010, 1960 to 2015 and 1960 to 2020 (columns 4, 5 and 6). We obtain more precise estimates of the quadratic term when more recent data is used.

The marginal effects of credit to the private sector on manufacturing are plotted in Figure 1. We observe that the negative marginal effect of financial depth is no longer statistically significant when credit to the private sector reaches 40% of GDP. The marginal effect becomes positive when credit to the private sector is at 55% of GDP. The effect is positive and statistically significant when credit to the private sector reaches 96% of GDP. Plotting the graph of the relationship between finance and manufacturing for different periods in Figure 2, allows us to observe the shift in the impact of finance from negative in the earlier periods of 1960 to 1995 and 1960 to 2000, to positive in the later periods starting from 1960 to 2005, 1960 to 2010 , 1960 to 2015 and 1960 to 2020.

Our result differs from the findings in Ikhide (2015) for Africa, and others such as Ductor and Grechyna (2011), Hassan et al. (2011), Yilmazkuday (2011), Barajas et al. (2012), Cecchetti and Kharroubi (2012), Pagano (2012), Yu et al. (2012), Law and Singh (2014) and Arcand et al. (2015). These studies show an inverted-U shape for the marginal effect of finance on growth. We show that the relationship between finance and growth differs from the relationship between finance and manufacturing in that, while more finance exerts a negative effect on growth, it can spur manufacturing if directed adequately.

11. Conclusion

The relationship between finance and manufacturing in Africa remains negative and the gap between both continues to widen. This negative relationship is evident in the decline in manufacturing value added on the continent, yet with ever-increasing levels of financial development. We show that this has detrimental effects on economic development in the region. Such a position is nuanced in the consensus that the literature needs to fill the gap of describing more sufficiently how financial development influences resource allocation decisions in ways that foster productivity growth, not least across the productive sectors of the economy.

We show that the potential of finance to contribute to development and, indeed, to the structural transformation of the continent lies in directing it towards manufacturing. In linking finance to structural transformation in Africa, finance can be made more productive. Directing finance to non-productive sectors, not least the extractive sectors as it is often the case in Africa, serves to reinforce the negative effect of finance on development, and further impedes the structural transformation efforts on the continent.

Table 4: Financial development and manufacturing

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
LMVA(t-1)	0.672***	0.860***	0.788***	0.854***	0.791***	0.794***	0.713***	0.861***	0.806***	0.867***	0.812***	0.818***
	(0.161)	(0.118)	(0.128)	(0.119)	(0.0495)	(0.0492)	(0.154)	(0.110)	(0.123)	(0.140)	(0.0595)	(0.0585)
LPC	0.0471	-0.0166	0.0103	-0.0398	-0.0608	-0.0574						
	(0.0822)	(0.0457)	(0.0452)	(0.0568)	(0.0370)	(0.0362)						
PC							0.132	-0.101	-0.00577	-0.179	-0.220*	-0.205*
							(0.291)	(0.181)	(0.183)	(0.185)	(0.117)	(0.105)
LGDPPC	0.641	0.384	0.428	0.303	0.530**	0.599**	0.745	0.410	0.452	0.208	0.380	0.449*
	(0.798)	(0.483)	(0.528)	(0.447)	(0.225)	(0.235)	(0.741)	(0.420)	(0.482)	(0.501)	(0.247)	(0.249)
$LGDPPC^2$	-0.0405	-0.0262	-0.0279	-0.0197	-0.033**	-0.037**	-0.0473	-0.0279	-0.0295	-0.0139	-0.0231	-0.0278*
	(0.0527)	(0.0326)	(0.0368)	(0.0294)	(0.0151)	(0.0156)	(0.0487)	(0.0287)	(0.0338)	(0.0327)	(0.0167)	(0.0166)
LOPEN	-0.0337	0.123	0.0912	0.146	0.0691	0.0548	0.00501	0.117	0.0999	0.139	0.0441	0.0325
	(0.156)	(0.116)	(0.0869)	(0.105)	(0.0588)	(0.0569)	(0.146)	(0.111)	(0.0890)	(0.0997)	(0.0577)	(0.0547)
LFDI	-0.00606	-0.0177	-0.0193	-0.0188	-0.021***	-0.020***	-0.0156	-0.0194	-0.0219	-0.0177	-0.0169*	-0.0154*
	(0.0212)	(0.0227)	(0.0120)	(0.0138)	(0.007)	(0.008)	(0.0211)	(0.0240)	(0.0134)	(0.0169)	(0.00895)	(0.00932)
LPOP	0.0212	0.00451	0.00672	0.0118	0.00941	0.0116	0.0156	0.00117	0.00545	0.00952	0.00513	0.00706
	(0.0440)	(0.0312)	(0.0291)	(0.0259)	(0.0206)	(0.0196)	(0.0445)	(0.0305)	(0.0299)	(0.0265)	(0.0203)	(0.0191)
Constant	-1.462	-1.624	-1.607	-1.683	-2.170**	-2.395**	-2.131	-1.579	-1.765	-1.154	-1.305	-1.558
	(2.395)	(1.293)	(1.593)	(1.407)	(0.917)	(0.995)	(2.407)	(1.135)	(1.443)	(1.650)	(0.940)	(0.998)
Observations	82	104	126	149	174	198	83	105	127	150	175	199
Number of ID	25	26	27	27	27	27	25	26	27	27	27	27
AR1	-1.08	-2.03	-2.39	-2.15	-2.37	-2.35	-1.08	-1.95	-2.45	-2.10	-2.33	-2.31
P value	0.281	0.042	0.017	0.032	0.018	0.019	0.280	0.051	0.014	0.035	0.020	0.021
AR2	-0.50	-1.07	-1.45	-1.39	-1.49	-1.54	-0.52	-1.05	-1.31	-1.24	-1.50	-1.55
P value	0.616	0.283	0.147	0.165	0.137	0.124	0.605	0.292	0.190	0.215	0.134	0.121
OID	9.84	3.70	5.96	7.24	4.59	4.43	8.17	2.98	5.28	6.72	4.00	4.00
P value	0.043	0.593	0.427	0.404	0.800	0.816	0.086	0.703	0.509	0.459	0.828	0.857
Period	1960-1995	1960-2000	1960-2005	1960-2010	1960-2015	1960-2020	1960-1995	1960-2000	1960-2005	1960-2010	1960-2015	1960-2020

Table 5: Square of the level of financial development and manufacturing

	(1)	(2)	(3)	(4)	(5)	(6)
LMVA(t-1)	0.714***	0.860***	0.825***	0.905***	0.813***	0.817***
	(0.144)	(0.106)	(0.119)	(0.135)	(0.0543)	(0.0554)
PC	0.175	-0.109	-0.348	-0.711	-0.770**	-0.732**
	(0.825)	(0.495)	(0.469)	(0.498)	(0.361)	(0.349)
PC^2	-0.0746	0.00164	0.485	0.704	0.726*	0.670**
	(0.939)	(0.575)	(0.592)	(0.506)	(0.376)	(0.340)
LGDPPC	0.720	0.385	0.524	0.258	0.558***	0.642***
	(0.727)	(0.412)	(0.479)	(0.415)	(0.203)	(0.211)
$LGDPPC^2$	-0.0459	-0.0262	-0.0343	-0.0169	-0.0346***	-0.0402***
	(0.0474)	(0.0281)	(0.0331)	(0.0268)	(0.0133)	(0.0137)
LOPEN	0.00449	0.120	0.115	0.157	0.0666	0.0545
	(0.161)	(0.116)	(0.0921)	(0.104)	(0.0590)	(0.0572)
LFDI	-0.0142	-0.0192	-0.0233*	-0.0186	-0.0217***	-0.0212***
	(0.0198)	(0.0235)	(0.0124)	(0.0153)	(0.00776)	(0.00809)
LPOP	0.0156	0.00265	0.00752	0.0126	0.00765	0.00950
	(0.0422)	(0.0314)	(0.0288)	(0.0254)	(0.0201)	(0.0190)
Constant	-2.034	-1.530	-2.132	-1.515	-2.054**	-2.355**
	(2.366)	(1.088)	(1.516)	(1.478)	(0.879)	(0.957)
Observations	83	105	127	150	175	199
Number of ID	25	26	27	27	27	27
AR1	-0.94	-1.94	-2.46	-2.11	-2.36	-2.35
P value	0.345	0.052	0.014	0.035	0.018	0.019
AR2	-0.55	-1.04	-1.31	-1.32	-1.49	-1.54
P value	0.586	0.298	0.192	0.188	0.136	0.123
OID	8.27	3.06	5.24	6.41	3.79	3.85
P value	0.082	0.691	0.513	0.493	0.876	0.870
Period	1960-1995	1960-2000	1960-2005	1960-2010	1960-2015	1960-2020
dGR/dPC = 0	1.17	(-)	0.36	0.51	0.53	0.55

Robust (Windmeijer) standard errors in parentheses

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

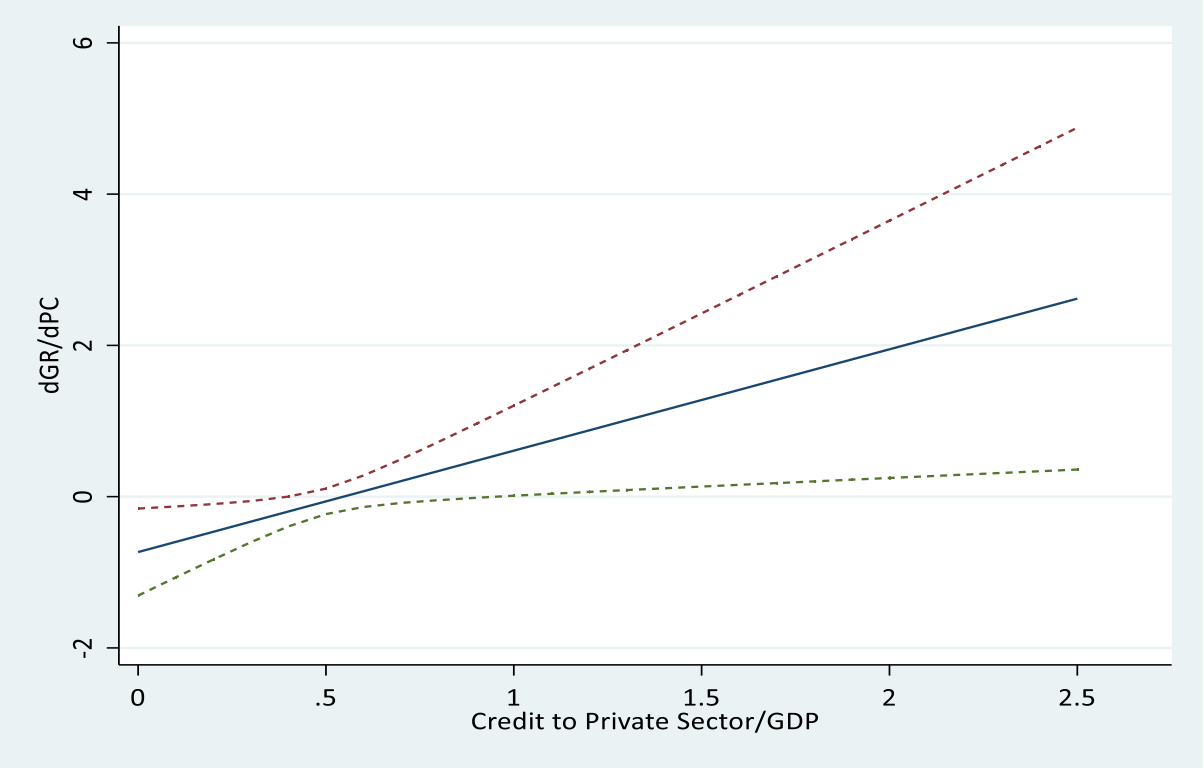

Figure 1: Marginal effects for estimation of period 1960 to 2020, as illustrated in Table 5

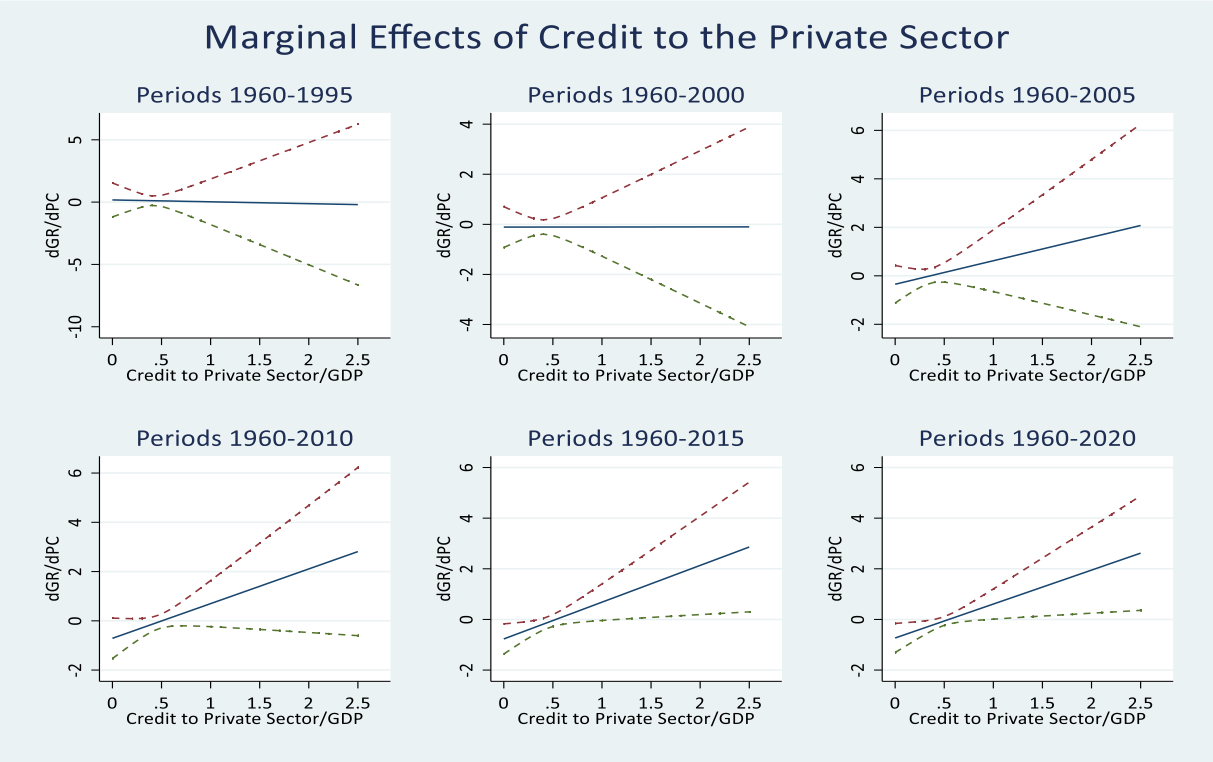

Figure 2: Marginal effects for estimation of period 1960 to 2020, as illustrated in Table 5

References

Abu-Bader, S. & Abu-Qarn, A. S. (2008). Financial development and economic growth: The Egyptian experience. *Journal of Policy Modelling*, 887-898.

Agu, C. C. & Chukwu, J. O. (2009). Multivariate causality between financial depth and economic growth in Nigeria. *African Review of Money Finance and Banking*, 7-21.

Ahmed, A. D. (2010). Financial liberalisation, financial development and growth linkages in Sub-Saharan African countries: An empirical Investigation. *Studies in Economics and Finance*, 27: 314-339.

Akinlo, A. E. & Egbetunde, T. (2010). Financial development and economic growth: The experience of 10 Sub-Saharan African countries revisited. *The Review of Finance and Banking*, 2: 17-28.

Allen, F., Carletti, E., Cull, R., Qian, J., Senbet, L. & Valenzuela, P. (2012). Resolving the African financial development gap: Cross-country comparisons and a within-country study of Kenya. In S. Edwards, S. Johnson & D. N. Weil (eds), *African successes, Volume III: Modernization and development* (pp. 13-62). Chicago, Ill: University of Chicago Press.

Andreoni, A. & Tregenna, F. (2020). Escaping the middle-income technology trap: A comparative analysis of industrial policies in China, Brazil and South Africa. *Structural Change Economic Dynamics*, 54: 324-340.

Arcand, J. L., Berkes, E. & Panizza, U. (2015). Too much finance? *Journal of Economic Growth*, 20(2): 105-148.

Arellano, M. & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1): 29-51.

Atindehou, R. B., Gueyie, J. P. & Amenounve, E. K. (2005). Financial intermediation and economic growth: Evidence from Western Africa. *Applied Financial Economics*, 15(11): 777-790.

Avenyo, E. K., Tregenna, F. & Kraemer-Mbula, E. (2021). Do productive capabilities affect export performance? Evidence from African firms. *The European Journal of Development Research*. https://doi.org/10.1057/s41287-021-00364-6

Banerjee, A., Duflo, E., Glennerster, R. & Kinnan, C. (2015). The miracle of microfinance? Evidence from randomised evaluation. *American Economic Journal: Applied Economics*, 7(1): 22-53.

Bangake, C. & Eggoh, J. C. (2011). Further evidence on finance-growth causality: A panel data analysis. *Economic Systems*, 35: 176-188.

Barajas, A., Chami, R. & Reza, S. (2012). The finance and growth nexus re-examined: Do all countries benefit equally? IMF Working Paper No. WP/13/130. Washington, DC: International Monetary Fund.

Bagehot, W. (1873). *Lombard Street. A description of the money market*. Homewood, III: Richard D. Irwin.

Bateman, M. (2014). South Africa's post-apartheid microcredit-driven calamity. *Law, Democracy and Development*, 18(1): 92-135.

Beck, T., Levine, R. & Loayza, N. (2000). Finance and the sources of growth. *Journal of Financial Economics*, 58(1-2): 261-300.

Beck, T., Cull, R. & Jerome, A. (2005). Bank privatisation and performance: Empirical evidence from Nigeria. *Journal of Banking and Finance*, 29: 2355-2379.

Beck, T., Demirguc-Kunt, A., Luc, L. & Vojislav, M. (2006). The determinants of financing obstacles. *Journal of International Money and Finance*, 25(6): 392-352.

Beck, T. & Cull, R. (2014a). Banking in Africa. In N. B. Allen, P. Molyneux & J. O. S. Wilson (eds), *The Oxford handbook of banking*. Oxford: Oxford University Press.

Beck, T. & Cull, R. (2014b). SME finance in Africa. World Bank Policy Research Working Paper No. 7018. Washington, DC: World Bank Group. Available from: http://documents.worldbank.org/curated/en/294741468006614213/SME-finance-in-Africa

Beck, T., Fuchs, M. & Uy, M. (2009). Finance in Africa: Achievements and challenges. In World Economic Forum, World Bank and African Development Bank (eds), *The Africa c*ompetitiveness *r*eport *2009* (pp. 31-47). Washignton D.C.: World Bank.

Beegle, K., Christiaesen, L., Dabalen, A. & Gaddis, I. (2016). *Poverty in a rising Africa: Africa poverty report*. Washington, DC: The World Bank.

Biggs, T. & Srivastava, P. (1996). Structural aspects of manufacturing in Sub-Saharan Africa. Findings from a seven country enterprise survey. World Bank Discussion Paper 346 (Africa Technical Series). Washington, DC: The World Bank.

Bigsten, A., Collier, P., Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J. W., Oduro, A., Oostendorp, P., Patillo, C., Soderbom, M., Teal, F. & Zeufack, A. (2003). Credit constraints in African manufacturing enterprises in Africa. *Journal of African Economies*, 12(1): 104-125.

Bluestone, B. & Harrison, B. (1982). *The deindustrialization of America*. New York: Basic Books.

Blundell, R. & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1): 115-143.

Bowsher, C. G. (2002). On testing overidentifying restrictions in dynamic panel data models. *Economics Letters*, 77(2): 211-220.

Burhop, C. (2006). Did banks cause the German industrialization? *Explorations in Economic History*, 43(1): 39-63.

Cecchetti, G. & Kharroubi, E. (2012). Reassessing the impact of finance on growth. BIS Working Papers No. 381. Basel: Bank for International Settlements.

Cerra, V. & Saxena, S. C. (2008). Growth dynamics: The myth of economic recovery. *American Economic Review*, 98(1): 439-457.

Chandler, A. D. Jr. (1977). *The visible hand: The managerial revolution in American business*. Cambridge, MA: Harvard University Press.

Chang, H. & Bateman, M. (2012). Microfinance and the illusion of development: From hubris to nemesis in thirty years. *World Economic Review*, 1: 13-36.

Claessens, S., Demirguc-Kunt, A. & Huizinga, H. (2001). How does foreign entry affect domestic banking markets? *Journal of Banking and Finance*, 25(5): 891-911.

Cripps, T. & Tarling, R. (1973). Growth in advanced capitalist economies 1950-70. Occasional Paper No. 40, Department of Applied Economics. Cambridge: University of Cambridge.

Dasgupta, S. & Singh, A. (2006). Manufacturing, services and premature deindustrialization in developing countries: A Kaldorian analysis. Wider Working Paper No. 49/2006. Helsinki: UNU-WIDER.

Daway-Ducanes, S. l. S. & Gochoco-Bautista, M. S. (2019). Manufacturing and services growth in developing economies: 'Too little' finance? *Progress in Development Studies*, 19(1): 55-82.

Deaton, A. & Miller, R. (1995). International commodity prices, macroeconomic performance and politics in Sub-Saharan Africa. *Journal of African Economies*, 5(3): 99-191.

Deidda, L. & Fattouh, B. (2002). Non-linearity between finance and growth. *Economics Letters*, 74(3): 339-345.

Demir, F. (2007). The rise of rentier capitalism and the financialization of real sectors in developing countries. *Review of Radical Political Economics*, 39: 351-359.

Ductor, L. & Grechyna, D. (2011). Excess financial development and economic growth. Working Paper, Department of Economics, University of Alicante. Available from: http://econfin.massey.ac.nz/school/seminar%20papers/albany/2012/Ductor-PII.pdf

Dumenil, G. & Levy, D. (2004). *Capital resurgent: Roots of the neoliberal revolution*. Cambridge, MA: Harvard University Press.

Easterly, W., Islam, R. & Stiglitz, J. E. (2000). Shaken and stirred: Explaining growth volatility. In *Annual Bank Conference on Development Economics* (pp. 191-211). Washington, DC: World Bank.

Felipe, J. (2010). *Inclusive growth, full employment and structural change*. Gurgaon and Manila: Anthem Press, India and Asian Development Bank.

GGDC (2021). Groningen Growth and Development Centre, viewed 15 July 2021, https://www.rug.nl/ggdc/productivity/pwt/

Gerschenkron, A. (1952). Economic backwardness in historical perspective. In B. Hoselitz (ed), *The progress of underdeveloped areas* (pp. 5-30). Chicago: University of Chicago Press.

Ghirmay, T. (2004). Financial development and economic growth in Sub-Saharan African countries: Evidence from time-series analysis. *African Development Review*, 16(3): 415-432.

Giovanni, A. (1985). Savings and the rate of interest in LDCs. *Journal of Development Economics*, 18: 197.217.

Goldsmith, R. W. (1969). *Financial structure and development*. New Haven, CT: Yale University Press.

Gries, T., Kraft, M. & Meierrieks, D. (2009). Linkages between financial deepening, trade openness, and economic development: Causality evidence from Sub-Saharan Africa. *World Development*, 37(12): 1849-1860.

Griffith-Jones, S. & Karwowski, E. (2013). Finance and growth in Sub-Saharan Africa: Policy and research challenges. Working paper prepared for JICA/IPD Africa Task Force Meeting, Yokohama, Japan, June 2-3.

Hall, P.A. & Soskice, D. (Eds.). (2001). *Varieties of capitalism: The institutional foundations of comparative advantage*. Oxford: Oxford University Press.

Hassan, M. K., Sanchez, B. & Yu, J. (2011). Financial development and economic growth: New evidence from panel data. *The Quarterly Journal of Economics and Finance*, 51(1): 88-104.

Hirschman A. O. (1958). *The strategy of economic development*. New Haven, CT: Yale University Press.

Hirschman, A. O. (1992). Industrialization and its manifold discontents: West, East and South. *World Development*, 20(9): 1225-1232.

Ikhide, S. I. (2015). *The finance and growth debate in Africa: What role for financial inclusion? Inaugural Lecture*. Bellville: University of Stellenbosch Business School, Stellenbosch University.

International Monetary Fund (IMF). (2015). Rethinking financial deepening: Stability and growth in emerging markets. IMF Staff Discussion Note, SDN/15/08. Washington, DC: IMF.

Itaman, R. E. & Awopegba, O. E. (2021). Finance, oil rent and premature deindustrialisation in Nigeria. *Structural Change and Economic Dynamics*, 59: 149-161. Available from: https://doi.org/10.1016/j/strueco.2021.06.006

Itaman, R. & Wolf, C. (2021). Industrial policy and monopoly capitalism in Nigeria: Lessons from the Dangote business conglomerate. *Development and Change*, 52(6): 1473-1502. https://doi.org/10.1111/dech.12675

Jalilian, H. & Kirkpatrick, C. (2002). Financial development and poverty reduction in developing countries. *International Journal of Finance and Economics*, 7(2): 97-108.

Jalilian, H. & Weiss, J. (2000). De-industrialisation in Sub-Saharan Africa: Myth or crisis? *Journal of African Economies*, 9(1): 24-43.

Jung, W. S. (1986). Financial development and economic growth: International evidence. *Economic Development and Cultural Change*, 34(2): 333-346.

Kaboski, J. & Townsend, R. (2011). A structural evaluation of a large-scale quasi experimental microfinance initiative. *Econometrica*, 79(5): 1357-1406.

Kaldor, N. (1966). *Causes of the slow rate of economic growth of the United Kingdom: An inaugural lecture*. Cambridge: Cambridge University Press.

Kaldor, N. (1970). The case for regional policies. *Scottish Journal of Political Economy*, 17(3): 337-348.

Kaminsky, G. & Reinhart, C. (1999). The twin crises: The causes of banking and balance of payments problems. *American Economic Review*, 89(3): 473-500.

Khan, M., Senhadji, A. & Smith, B. (2001). Inflation and financial depth. IMF Working Paper No. WP/01/44 Washington, DC: International Monetary Fund.

King, R. G. & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, 108(3): 717-738.

Law, S. H. & Singh, N. (2014). Does too much finance harm economic growth? *Journal of Banking and Finance*, 41(C): 36-44.

Lawrence, P. (2016). Is there an African problem? In J. Weiss & M. Tribe (eds), *Routledge handbook of industry and development* (pp. 350-381). London: Routledge.

Lee, C. C. & Chang, C. P. (2009). Financial development and economic growth: International evidence. *Journal of Applied Economics*, XII: 247-249.

Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature*, 35(2): 688-726.

Levine, R. (2005). Finance and growth: Theory and evidence. In P. Aghion & S. N. Durlauf (eds), *Handbook of economic growth, Volume 1, Part A* (pp. 865-934). Oxford: Elsevier.

Levine, R. & Zervos, S. (1998). Stock markets, banks, and economic growth. *American Economic Review*, 88(3): 537-558.

Levine, R., Loayza, N. & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics*, 46(1): 31-77.

McKinnon, R. I. (1973). *Money and capital in economic development*. Washington, DC: Brookings.

Minsky, H. P. (1974). The modelling of financial instability: An introduction. In Modelling and *s*imulation, Vol. 5*, Part 1*. Proceedings of the Fifth Annual Pittsburgh Conference *on Modeling and Simulation* (pp. 267-272). Pittsburgh, PA: Instrument Society of America.

Mkandawire, T. & Soludo, C. (1999). Our continent, our future. Dakar Trenton, NJ and Ottawa: CODESRIA, Africa World Press and IDRC. Available from: www.idrc.ca/EN/Resource/Publications

Murinde, V. (2012). Financial development and economic growth: Global and African evidence. *Journal of African Economies*, 21(1): i10-i56. doi:10.1093/jae/ejr042

Noorbakhsh, F. & Paloni, A. (1999). Structural adjustment programs and industry in Sub-Saharan Africa: Restructuring or de-industrialization? *Journal of Development Areas*, 33(4): 549-580.

Nurkse, R. (1953). *Problems of capital formation in underdeveloped countries*. Oxford: Blackwell.

Odedokun, M. O. (1989). Causalities between financial aggregates and economic activities in Nigeria: The result from Granger's test. *Savings and Development*, 23: 101-111.

Odhiambo, N. M. (2008a). Financial deepening in Kenya: A dynamic test of the financial-led growth hypothesis. *Economic Issues*, 13(2): 21-36.

Odhiambo, N. M. (2008b). Financial depth, savings and econometric growth in Kenya: A dynamic causal linkage. *Economic Modelling*, 25(4): 704-713.

Ostry, J. D. & Reinhard, C. M. (1992). Private saving and terms of trade shock: Evidence from developing countries. IMF Working Paper No. WP/91/100. Washington, DC: International Monetary Fund.

Pagano, M. (2012). Finance: Economic lifeblood or toxin? CSEF Working Papers No. 326. Napoli: University of Naples.

Palma, J. G. (2008). De-industrialisation, 'premature' de-industrialisation and the Dutch disease. In L. E. Blume & S. N. Durlauf (eds), *The new Palgrave: A dictionary of economics* (2nd ed; pp. 401-410). Basingstoke: Palgrave Macmillan.

Prebisch, R. (1962). The economic development of Latin America and its principle problems. *Economic Bulletin of Latin America*, 7: 1-22.

Raj, S. N. R. & Sen, K. (2014). Finance constraint and firm transition in the informal sector: Evidence from Indian manufacturing. *Oxford Development Studies*, 43(1), 123-143.

Rajan, R. G. & Zingales, L. 1998. Financial dependence and growth. *American Economic Review*, 88(3): 559-686.

Ramey, G. & Ramey, V. A. (1995). Cross-country evidence on the link between volatility and growth. *American Economic Review*, 85(5): 1138-1151.

Rioja, F. & Valev, N. (2004). Finance and the sources of growth at various stages of economic development. *Economic Inquiry*, 42(1): 127-140.

Robinson, J. (1952). *The rate of interest and other essays*. London: Macmillan.

Rodrik, D. (2013). Unconditional convergence in manufacturing. *Quarterly Journal of Economics*, 128(1): 165-204.

Rodrik, D. (2016). Premature Deindustrialization. Journal of Economic Growth, 21(1), 1-33.

Roe, A. R. (2006). Financial systems in new middle-income African economies. WIDER Working Paper No. 89/2016. Helsinki: UNU-WIDER

Rosenstein-Rodan, P. (1943). Problems of industrialisation of East and South-East Europe. *The Economic Journal*, 53(210/211): 202-211.

Roodman, D. (2009a). How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata Journal*, 9(1): 86-136.

Roodman, D. (2009b). A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics*, 71(1): 135-158.

Rousseau, P. L. & Wachtel, P. (2002). Inflation thresholds and the finance-growth nexus. *Journal of International Money and Finance*, 21: 277-293.

Rousseau, P. L. & Wachtel, P. (2011). What is happening to the impact of financial deepening on economic growth? *Economic Enquiry*, 49(1): 276-288.

Rousseau, P. L. & Yilmazkuday, H. (2009). Inflation, financial development and growth: A trilateral analysis. *Economic Systems*, 33(4): 310-324.

Rowthorn, R. & Coutts, K. (2004). De-industrialisation and the balance of payments in advanced economies. UNCTAD Discussion Paper No. 170. Geneva: UNCTAD.

Rowthorn, R. & Ramswamy, R. (1997). *Deindustrialization - Its causes and implications*. Washington, DC: IMF.

Schularick, M. & Alan, M. T. (2012). Credit booms gone bust: Monetary policy, leverage cycles, and financial crises, 1870–2008. *American Economic Review*, 102(2): 1029-1061.

Schumpeter, J. A. (1911). *A theory of economic development*. Cambridge, MA: Harvard University Press.

Shaw, E. S. (1973). *Financial deepening in economic development*. New York: Oxford University Press.

Shen, C. H. & Lee, C. C. (2006). Same financial development yet different economic growth – Why? *Journal of Money, Credit and Banking*, 38(7): 1907-1944.

Stein, H. (1992) Deindustrialization, adjustment, the World Bank and the IMF in Africa. *World Development*, 20(1): 83-95.

Stewart, F., Lall, S. & Wange, S. (1992). *Alternative development strategies in Sub-Saharan Africa*. London: Macmillan.

Storm, S. (2018). Financialization and economic development: A debate the social efficiency of modern finance. *Development and Change*, 42(2): 302-329.

Szirmai, A. & Verspagen, B. (2015). Manufacturing and economic growth in developing countries, 1950–2005. *Structural Change Economic Dynamics*, 34(C): 46-59.

Tobin, J. (1984). On the efficiency of the financial system. *Lloyds Bank Review*, July: 1-15.

Tornell, A. (1990). Real vs. financial investment: Can Tobin taxes eliminate the irreversibility distortion? *Journal of Development Economics*, 32(2): 419-444.

Tregenna, F. (2011). Manufacturing productivity, deindustrialisation and reindustrialisation. UNU-WIDER Working Paper, No. 57/2011. Helsinki: United Nations University.

Tregenna, F. (2016). Deindustrialisation: An issue for both developed and developing countries. In J. Weiss & M. Tribe (eds), *Routledge handbook of industry and development* (pp. 12-23). London: Routledge.

Tribe, M. (2002). An overview of manufacturing development in Sub-Saharan Africa. In D. G. R. Belshaw & I. Livingstone (eds), *Renewing development in Sub-Saharan Africa: Policy performance and prospects* (pp. 263-284). London: Routledge.

Weiss, J. (1990). *Industry in developing countries*. London: Routledge.

Weiss, J. & Jalilian, H. (2016). Manufacturing as the engine of growth. In J. Weiss & M. Tribe (eds), *Routledge handbook of industry and development* (pp. 12-23). London: Routledge.

Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics*, 126(1): 25-51.

World Bank. (2017). *Financial inclusion: Overview*. The World Bank Group. Available from: http://www.worldbank.org/en/topic/financialinclusion/overview

World Bank (2020). World Development Indicators. Washington D.C., World Bank. https://databank.worldbank.org/reports.aspx?source= world- development- indicators#.

Yeung, H. W. (2016). Rethinking the East Asian developmental state in its historical context: Finance, geopolitics and bureaucracy. *Area in Development Policy*, 2(1): 1-23.

Yilmazkuday, H. (2011). Thresholds in the finance-growth nexus: A cross-country analysis. *The World Bank Economic Review*, 25(2): 278-295.

Yu, J., Hassan, M. K. & Sanchez, B. (2012). A re-examination of financial development, stock markets development and economic growth. *Applied Economics*, 44(27): 3479-3489.

Appendix 1

Table A1: Summary Statistics

Variable	Obs	Mean	Std. dev.	Min	Max
LMVA	288	2.220138	0.582813	-0.36264	3.540676
PC	328	-2.10172	0.875322	-5.30312	-0.03835
PC2	329	0.054607	0.110433	0	0.926176
LGDPPC	341	7.064633	1.019285	5.195985	9.882349
LGDPPC2	341	50.94493	15.0202	26.99826	97.66082
LOPEN	331	4.027784	0.515559	2.212206	5.347047
LFDI	263	0.061798	1.628902	-6.28046	3.475104
LPOP	420	15.18417	1.720049	10.66637	19.04104

The following are the countries included in the analysis: Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Chad, Comoros, Djibouti, Egypt, Arab Rep., Eswatini, Ethiopia, Gabon, Gambia, The, Ghana, Guinea, Kenya, Libya, Madagascar, Malawi, Mauritania, Mauritius, Niger, Nigeria, Rwanda, Sao Tome and Principe, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Togo, Tunisia and Zimbabwe. Excluded countries: Algeria, Equatorial Guinea, Eritrea, Guinea-Bissau, Namibia, Senegal, Sudan, Tanzania, Uganda, Zambia, Central African Republic, Congo, Dem. Rep., Liberia, Morocco, Congo, Rep., Cote d'Ivoire, Lesotho, Mali and Mozambique.

Source: Author's compilation

Table A2: Definitions of Variables

Variable	Definition
PC	Domestic credit to private sector by banks (% of GDP). Source: World Bank Development Indicators ([WDI] 2020)
FDINI	Foreign direct investment net inflows (% of GDP). Source: WDI (2020)
GDPPC	Gross domestic product (GDP) per capita (Constant 2010 US$). Source: WDI (2020)
MVA	Manufacturing, value added (% of GDP) (constant 2010 US$). Source: WDI (2020)
POP	Total population, counting all residents regardless of legal status or citizenship. Source: WDI (2020)
TRADE	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product (% of GDP). Source: WDI (2020)

Source: Author's computation

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