The puzzle of manufacturing divergence in Africa: a (Post-)Keynesian interpretation

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Abstract

This paper aims at explaining manufacturing divergence in Africa using a Kaldorian/Lewisian dual-sector model, debating the universality of the premature deindustrialisation argument, suggesting the existence of strong regional heterogeneities in the structural pattern of developing economies. Based on new data for Africa, we observe the presence of a puzzling manufacturing divergence between employment and value added for the African continent. This divergence does not directly fit into the two core theoretical patterns in the standard development literature (catching-up and premature deindustrialisation). While the current literature focuses on the problem of premature deindustrialization, in which the industrial sector has been losing its share before reaching its maturity phase, our empirical findings suggest that this argument should be embedded in a more complex and heterogeneous picture.

1. Introduction

There has been a recent rise in the number of academic contributions highlighting the matter of premature deindustrialisation. The literature highlights that it is a widespread phenomenon that countries around the world have been going through a process of deindustrialization. Many argue that this is an expected outcome of the new waves of industrialization, as mature economies start moving toward high tech activities, especially in the service sector, while manufacturing is outsourced towards developing economies, in special the ones in east Asia. While this process seem to be still a matter of debate, we observe that the process of deindustrialization is also affecting other developing regions, ones that never achieved a mature level of industrialization, but are still suffering from a decline in their share of manufacturing. The literature on premature deindustrialization highlights the challenges that countries in Africa, Latin America and Asia are facing in terms of maintaining the degree of complexity of their productive structure, observing a reversal towards services, but instead of those high-tech activities, they actually move towards those activities that absorb employment but a low productivity levels, sometimes involving a high degree of informality.

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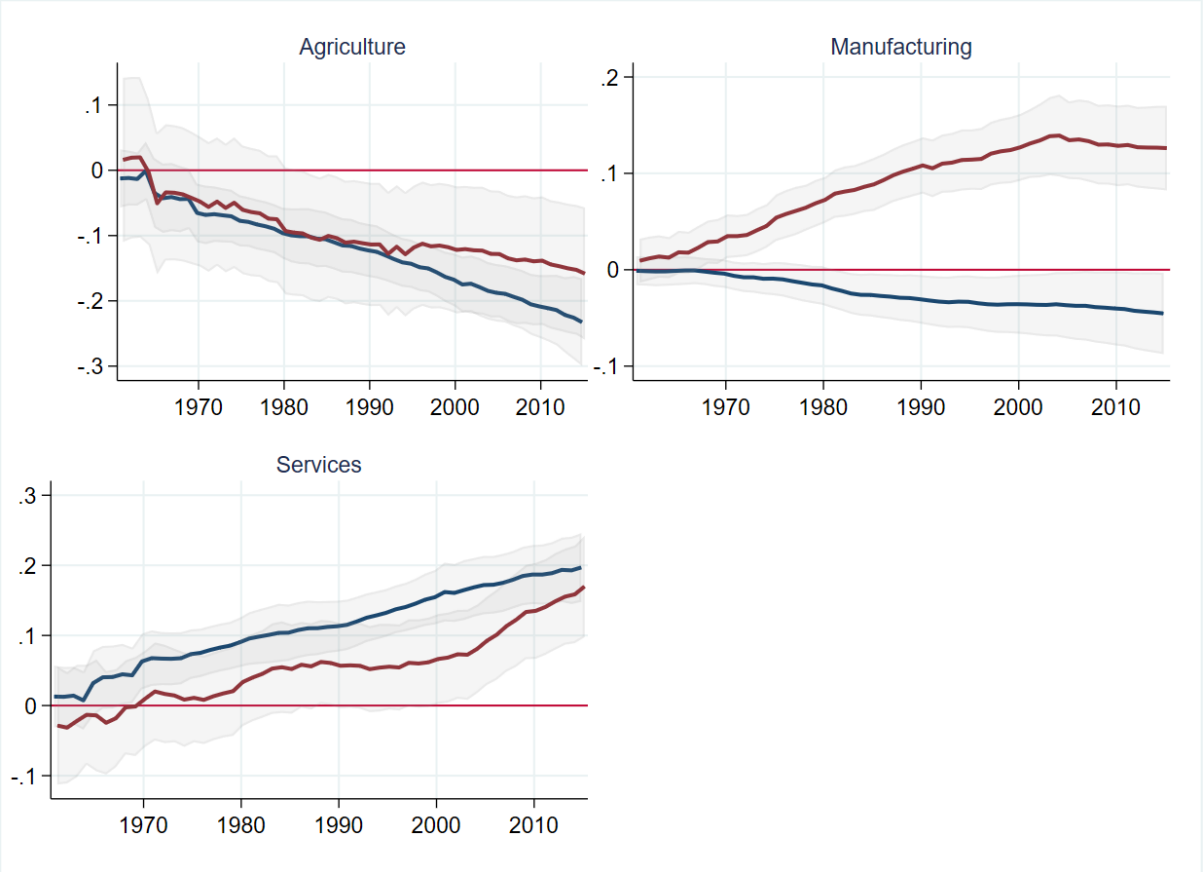
The debate on premature deindustrialization has been put in the center of the debate with Rodrik (2016). Until now the evidence has been pointing towards that direction despite the debate being still quite open. If we observe the case of subsaharian Africa, this debate has a higher level of complexity. Evidence has been pointing towards premature deindustrialization for countries such as South Africa (references). Nevertheless, there is a number of countries, such as Kenya and Ethiopia that, having started from a low degree of industrialization, see an increase in complexity and a surge on manufacturing activities. The evidence is mixed, and it is in this heterogeneity we aim at discussing an extra element of concern from previous evidence.

The debates in deindustrialization focus on two main measurements: the share of manufacturing value added on total GDP, and the share of employment in manufacturing activities on total GDP. Countries that have industrialized have seen the rise of both, while deindustrializing countries observe the decline in both measures. With the use of new data, we observe that, for subsaharian Africa, a different and particular behaviour seems to be occurring. In line with the premature deindustrialization argument, we indeed see a decline of manufacturing employment on total employment. However, at the same time, we see that manufacturing value added increases on total manufacturing. This phenomena is observable not only for the recent period, in which there has been an increase in economic integration, especially with China, but from a longer time frame. This stylized fact shows an interesting pattern that has discrepancy when compared to regions such as Latin America (in which both manufacturing and employment in manufacturing shares decline) or East Asian (in which both increase). This piece of evidence on divergence provides a puzzle, in which we try to answer in this research observing not only the patterns of supply, but also how the patters of demand have been operating in these economies. This research aims at providing a possible answer in a post-Keynesian framework to the question on why we observe manufacturing divergence in Africa.

Firstly, this paper examines the extent to which the existing results in the literature are sensitive to sample size and to new sectoral indicators. In order to achieve our research objective, we update the Extended Africa Sector Database (EASD) (Mensah & Szirmai, 2018; Mensah et al., 2022) with the new GGDC/UNU-WIDER Economic Transformation Database (ETD). Using this novel data, we are able to estimate and document a new pattern for Africa: a striking divergence between manufacturing share of value added and employment after controlling for income. While manufacturing share of output is increasing relative to the 1960s, manufacturing employment share consistently declines.

Figure 1. Value Added and Employment data for Africa



In red: sectoral Value Added. In blue: sectoral employment. Source: Own Elaboration

In order to understand the mechanisms that lead to this divergence between productivity and employment, we propose a Kaldorian model of the supply side, proposing an interpretation to the macroeconomic mechanisms behind this puzzling pattern with stable employment, capital utilization, and external sector. Our model is based on a dual sector model structure, with a dual economy with traditional and modern (manufacturing) sectors. The central aspect resides in the dynamic interaction between the sectoral aspects of the labour market, productivity, and investment, resulting in different patterns of value added and manufacturing employment dynamics. Our model relies on a dynamic system of differential equations with analytical solution, in which the steady state and stability are dependent on the combination of sensitivity parameters, which we validate empirically. Finally, we calibrate the model creating three stylized scenarios to represent the heterogeneity in developing countries: (1) catching-up pattern (East Asia), (2) premature deindustrialization scenario (Latin America), (3) divergence (Africa). We explain the characteristics of each pattern, linking those to the constraints and to the opportunities for economic development, growth, and distribution.

2. Theoretical Baseline Model

a. Production Function

The baseline model consists of an economy with two sectors à la Lewis (1954) and Nomaler et al. (2022), manufacturing and traditional (which composes agriculture and services). In line with the Kaldorian literature (Magacho & Spinola, 2021; Araujo & Trigg, 2015), the model uses a Leontief production function with fixed coefficients for the whole economy, in which there is no substitutability between labour and capital.

$$Y = min(aL, bK) \tag{1}$$

Following the long-term stability of the capital-output ratio ($b = k_b$), we look the case of a labour-constrained economy. From eq. (1), labour-constrained growth depends on labour productivity (a) and labour force (L). Productivity can be then written as:

$$a = \frac{Y}{L} \tag{2}$$

In growth rates:

$$\hat{a} = \hat{Y} - \hat{L} \tag{3}$$

The economy is composed by two sectors (manufacturing and traditional). In the manufacturing sector, Y_m is the manufacturing value added and L_m is the total employment on manufacturing:

$$\widehat{a_m} = \widehat{Y_m} - \widehat{L_m} \tag{4}$$

From the evidence we observe for Africa, there seems to be a divergence between the growth of manufacturing value added and growth in employment in manufacturing $\widehat{Y_m} > 0$ and $\widehat{L_m} < \hat{L}$ ($As\ share\ is\ fixed, \hat{L} = 0$), Which implies that manufacturing productivity has been growing at positive (and relatively high) rates $\widehat{a_m} > 0$. There is no a priori explanation for this behaviour, which will try to be explained in the next sections.

In order to make the system consistent, it is fundamental to guarantee stability conditions for labour (employment) and capital (utilization capacity).

b. Labour market:

In order to guarantee employment stability, we model the labour market. Considering the total labour force as N, and employed labour force as L, the employment rate (E) is given by:

$$E = \frac{L}{N} = \frac{Y}{aN} \tag{5}$$

In terms of growth rates:

$$\hat{E} = \hat{Y} - \hat{a} - \hat{N} \tag{6}$$

From the evidences for Africa, the manufacturing factor has a reduction on employment, but the aggregate employment rate has to be stable in the long-run $E^* = k_E$, which means that we observe that workers in manufacturing are moving to other sectors (with lower productivity),

in a very much similar case to the premature deindustrialization argument (Andreoni & Tregenna, 2018; Rodrik, 2016). For the manufacturing sector, that results (as $\widehat{E_m} = 0$) in:

$$\widehat{N_m} = \widehat{Y_m} - \widehat{a_m} \quad (7)$$

For Africa, because productivity grows in manufacturing at a higher pace than value added, $\widehat{a_m} > \widehat{Y_m}$, and the aggregate employment rate is stable, then $\widehat{N_m} < 0$. That means that employment is moving to another sector, being absorbed by the urban traditional sector, usually in services (N_s), which consists of a high share of informality and lower productivity. From now on, we consider services as the main component of the traditional sector, and all subscript with *s* will refer to that.

Assuming that constant (or zero) population growth in this dual-sector economy ($\widehat{N} = k_N \; and \; \widehat{N} = 0$), then $N_s = N - N_m$, which tells us that the working population in the traditional sector will grow only when the number of workers in manufacturing grows at a smaller pace than the aggregate growth of the labour force. We assume that workers decide between being on manufacturing or on services, and this decision depends on the unemployment rate on manufacturing. When unemployment rates in manufacturing starts to increase, workers then move to services.

c. The service (traditional) sector

The service sector in this economy works as the labour supplier (Lavopa, 2015; Nomaler et al., 2021), being the sector that supplies/absorbs manufacturing employment.

$$\widehat{E_s} = \widehat{Y_s} - \widehat{a_s} - \widehat{N_s} \quad (8)$$

In the case of the observed divergence between a_m and Y_m, then employment in services get a higher share of total employment, with $\widehat{N_s} > 0$. Assuming that productivity in the service sector is stagnant (high share of informality in SSA) then $\widehat{a_s} = 0$. That implies that the growth of the service sector will be equal to the growth of total labour force employed in this sector (with constant employment), $\widehat{Y_s} = \widehat{N_s}$

Employment growth in services has an opposite sign of employment growth in manufacturing. Adding a variable that defines the elasticity of this inter-sectoral movement to keep employment growth stable as α, then:

$$\widehat{N_s} = f\left(\widehat{N_m}\right) = -\alpha\widehat{N_m} \;\; , \alpha > 0 \quad (9)$$

The growth rate of the service sector depends on the amount of people moving to this sector:

$$\widehat{Y_s} = \widehat{N_s} = \alpha\widehat{N_m} \quad (10)$$

In summary:

	Aggregate Economy	Manufacturing	Services
Productivity	$\hat{a} > 0$ or $\hat{a} < 0$	$\widehat{a_m} = f(\widehat{N_m}, \widehat{Y_m}) > 0$	$\widehat{a_s} = 0$
Employment	$\widehat{N} = 0$	$\widehat{N_m} < 0$ (?)	$\widehat{N_s} = -\alpha\widehat{N_m}$

Output	$\hat{Y} = f(\widehat{Y_m}, \widehat{Y_s})$	$\widehat{Y_m} > 0$ (?)	$\widehat{Y_s} = \widehat{N_s} = -\alpha\widehat{N_m}$

Productivity in manufacturing increases, which, *ceteris paribus*, raises the average productivity of the economy. However, there is an inertial component that is present, as this rise in productivity comes hand in hand with workers moving towards the service sector. That compositional effect results in a reduction in productivity growth. The results will depend on the relationship between productivity increases in manufacturing and the elasticity of workers that move to services (α).

d. Capacity utilization

In this section we focus on the case of capital constraints, to guarantee the stability of capital. With capital constraints, there is the need to consider the role of capacity utilisation (u). Producers, in order to protect from competition, allow to have a rate of idle capacity in order to answer to potential competitive threats. In this sense, we assume that capacity, in the long-run, is stable, but smaller than 1 ($0 < u^* < 1$). Representing the Leontief function with capital constraints:

$$Y = min(aL, ubK) \tag{11}$$

Considering the case for capital constraints, then $Y = ubK$, resulting that capacity utilization is given by:

$$u = \frac{Y}{bK} \tag{12}$$

In growth rates:

$$\hat{u} = \hat{Y} - \hat{b} - \hat{K} \tag{13}$$

As capital productivity is a constant and capacity utilization has to be stable in the long run (references), then growth follows capital accumulation:

$$\hat{Y} = \hat{K} \tag{14}$$

Considering that capital accumulates positively with investment, but is discounted by depreciation, capital accumulation in the economy can be represented by:

$$\hat{K} = \frac{I}{K} - \delta \tag{15}$$

In a dual sector economy proposed in this article, capital is split between manufacturing and services ($K = K_m + K_S$), and capital accumulation in the service sector grows at the same rate as its output growth rate:

$$\widehat{K_s} = \widehat{Y_s} = -\alpha\widehat{N_m} \tag{16}$$

The next step regards defining capital accumulation on manufacturing. Assuming no depreciation (for simplification):

$$\widehat{K_m} = \widehat{Y_m} = I_m \tag{17}$$

That means that Investment in manufacturing plays a central role in guiding the behaviour of the system. Following the Kaldorian literature, a central element for productivity increases regards learning by doing, in which higher activities offer opportunity for learning, raising productivity (Porcile & Lima, 2010). Modelling labour productivity in the manufacturing sector by including a Kaldor-Verdoorn effect results in:

$$\widehat{a_m} = f(I_m) = \beta I_m \tag{18}$$

The final effects of divergence on the productivity of the economy will then depend on α and β.

The research question requires understanding what drives the divergence between manufacturing employment and manufacturing output ($\widehat{L_m}$ and $\widehat{Y_m}$). That requires endogenizing $\widehat{N_m}$ and I_m. If $\widehat{N_m}$ and I_m grow exogenously, the growth rate of the economy should be equal to the growth rate of population (n) in order to keep the manufacturing sector stable ($\widehat{Y_m} = \widehat{K_m} = \widehat{N_m} = \widehat{N} = n$). If Y_m and n grow at different rates, the system will not have a solution. That requires endogenization of the system.

Finally, the whole system can be summarize as depending on two main elements that need to be further developed in the following sections:

1) Eq(16): The growth of total employment in the manufacturing sector ($\widehat{N_m}$)
2) Eq(18): Investment in the manufacturing sector ($I_m = \widehat{Y_m}$)

3. Model Closure: Kaleckian solution to a Kaldorian problem.

5.1. Mark-up and distribution

In the post-keynesian Kaleckian literature we use the concept of functional income distribution in terms of profits and wages. Investment and growth can be modelled, in line with profit-/wage- led debate, in terms of the functional income distribution. Wage share is represented as the real wage - unitary nominal wage (W) divided by price levels (P) - multiplied by Labour-Output ratio (inverse of productivity):

$$\omega = \frac{WL}{PY} \tag{19}$$

Being total income divided in wages and profits, the profit share is the part of total income that does not go to wages.

$$\pi = 1 - \omega \tag{20}$$

If we assume that this economy is an oligopolistic economy with mark-up pricing, from the cost price theory that follows that price is set by mark-up over costs. Having labour as only variable cost, then:

$$P = z\left(\frac{W}{a}\right) \tag{21}$$

In which z represents the mark-up. Finally, if we replace P in ω, as $a = Y/L$, then the profit share equation can be summarized as:

$$\pi = \frac{z-1}{z} \tag{22}$$

Which means that the profit share of the economy depends unique and exclusively on the degree of monopoly of the economy, linking monopoly to distribution, which has important implications to investment determination.

Some important assumptions are used from now on regarding the service sectors: (I) the service sector does not save, as we are dealing with a developing economy, in which the service sector has a stagnant productivity (informality). Everything that is produced is then consumed. (II) Following the Lewis (1954) model, services are modelled as a perfectly competitive sector, in which $z_s = 1$. For this reason $\omega_s = 1$ and $\pi_s = 0$. Thinking services as a profit-share sector, it mainly does not invest if not to accommodate a growing population.

5.2. Dynamic system

The manufacturing sector operates in a different way than the service sector, being able to save and having a monopolistic structure.

Following the neo-kaleckian literature (Bhaduri & Marglin, 1990), investment reacts to changes in capacity utilization, as it signalizes a growth of economic activity, indicating the positive effect of aggregate demand. It is implicit in our model that wages follow productivity, which is higher in the manufacturing sector. A growth in employment in the manufacturing sector increases wages, the pool of resources for consumption, reducing inventories and signalizing a stronger economic activity that would demand further investments. This assumption serves a way to add capacity in terms of employment, and not capital (as in Bhaduri & Marglin, 1990). A higher share of employment in manufacturing will then have a positive effect on investment, moderated by a sensitivity parameter (ϱ).

Investment follows the ideas developed in the Keynesian tradition, being caused by decisions based on future expectations under an environment of uncertainty (Davidson, 1991). That is captured by an animal spirit component, represented by ϕ. The rate of capital accumulation is then represented linearly by:

$$\widehat{K} = \frac{I_m}{K} = \phi + \lambda\left(1 - \frac{1}{z_m}\right) + \varrho\left(\frac{N_m}{N}\right) \tag{23}$$

Manufacturing employment share works as a predictor of economic activity and boosts firms' investments to protect market share. Investment decision depends if the economy in the

manufacturing sector will follow a wage-led or a profit-led pattern. The pattern of the economy will depend on the parameter λ. Considering that the service sector does not have profits, we make an initial assumption that investment increases as the manufacturing sector grows when we have a profit-led economy ($\lambda > 0$).

The profit share, as in eq.(22) depends on the mark-up. In a simplistic way we assume that the mark-up of the economy tends to move toward the desired market power of the capitalists ($\overline{z_m}$), in this sense:

$$\widehat{z_m} = \varphi(\overline{z_m} - z_m) \tag{24}$$

Finally, employment in manufacturing will depend on the size of the manufacturing sector itself (N_m), on the answer of employment to de deviation of the market share in the sector to the desired one, with an elasticity of ψ, and around an exogenous growth rate of employment (θ):

$$\widehat{N_m} = \theta + \chi N_m + \nu K_m - \psi(\bar{z} - z) \tag{25}$$

From eq.(25), χ represents how much hard it is to keep increasing manufacturing employment the more it grows. The parameter ν represents the answer of employment to increases in investments in manufacturing, as more capital will attracts more workers, with higher employment opportunities.

Finally, the dynamic system of the economy is then described by a set of three moving equations:

$$\widehat{K_m} = \phi K_m + \lambda\left(1 - \frac{1}{z_m}\right) + \varrho\left(\frac{N_m}{N}\right) \tag{23}$$

$$\widehat{z_m} = \varphi(\overline{z_m} - z_m) \tag{24}$$

$$\widehat{N_m} = \theta + \chi N_m + \nu K_m - \psi(\bar{z} - z) \tag{25}$$

Table 1. Parameters and expected values

ϕ	Sensitivity of investment to the level of capital stock.	$\phi < 0$ Decreasing, as more capital stock makes it harder to keep the pace of investment increases.
λ	Sensitivity of investment to the profit share.	$\lambda < 0$ Wage-led economy. $\lambda > 0$ Profit-led economy.
ϱ	Sensitivity of investment to employment rate (in the manufacturing sector).	$\varrho > 0$ A higher employment rate.
θ	Autonomous growth of employment in manufacturing.	$0 \leq \theta < \widehat{N}$ This autonomous growth should follow at maximum the growth rate of the total labour force (otherwise explodes).

χ	Sensitivity of manufacturing employment to itself.	$0 < \chi < 1$ More difficult to increase employment when it is high.
ν	Sensitivity of manufacturing employment to the level of capital in manufacturing	$\nu > 0$ More capital suggests more employment opportunities for workers to move to manufacturing. However, those workers must have the skills.
ψ	Sensitivity of employment to the mark-up	$\psi > 0$
φ	Speed of adjustment of the mark-up to its long-run rate	$\varphi > 0$ The higher the value, the faster industrialists will reach their desired rate of mark-up.

In table 1 we can observe the expected values for each of the parameters of the model.

5.3. Solution of the model:

a) Steady state:

$$\widehat{z_m} = \varphi(\overline{z_m} - z_m) = 0 \rightarrow z_m^* = \overline{z_m}$$

$$\widehat{K_m} = 0 \rightarrow K_m^* = -\frac{\varrho}{\phi}\left(\frac{N_m^*}{N}\right) = -\frac{\varrho}{\phi}\left(\frac{1}{N}\right)\frac{-\theta}{\left(\chi - \frac{\nu\varrho}{\phi N}\right)}$$

$$\widehat{N_m} \rightarrow \theta + \chi N_m - \frac{\nu\varrho}{\phi N}N_m = 0 \rightarrow N_m^* = \frac{-\theta}{\left(\chi - \frac{\nu\varrho}{\phi N}\right)}$$

b) Stability conditions

Observing the jacobian at the steady state, stability can be computed under the following characteristics (assuming when $z^* = z_m$, which will always be the case in the steady state):

$$J = \begin{vmatrix} \frac{\partial \widehat{K_m}}{\partial K_m} & \frac{\partial \widehat{K_m}}{\partial N_m} \\ \frac{\partial \widehat{N_m}}{\partial K_m} & \frac{\partial \widehat{N_m}}{\partial N_m} \end{vmatrix} = \begin{vmatrix} \phi & \frac{\varrho}{N} \\ \nu & \chi \end{vmatrix}$$

$$tr = \phi + \chi$$

$$det = \phi\chi - \frac{\nu\varrho}{N}$$

Conditions for Stability in a 2x2 system (negative eigenvalues): $tr < 0$ and $det > 0$

$$\phi + \chi < 0$$

$$\phi\chi > \frac{v\varrho}{N}$$

Solving the eigenvalue problem:

$$\begin{bmatrix} \phi & \frac{\varrho}{N} \\ v & \chi \end{bmatrix} - \begin{bmatrix} \lambda & 0 \\ 0 & \lambda \end{bmatrix} = 0$$

$$\begin{bmatrix} \phi - \lambda & \frac{\varrho}{N} \\ v & \chi - \lambda \end{bmatrix} = 0 \rightarrow (\phi - \lambda)(\chi - \lambda) - \frac{\varrho v}{N} = \lambda^2 - \lambda(\chi - \phi) + \phi\chi - \frac{\varrho v}{N} = 0$$

Making $\phi\chi - \frac{\varrho v}{N} = c$

$$\Delta = (\chi - \phi)^2 - 4c$$

$$\lambda_1 = \frac{[(\chi - \phi) - \sqrt{\Delta}]}{2}$$

$$\lambda_2 = \frac{[(\chi - \phi) + \sqrt{\Delta}]}{2}$$

Condition for cycles, negative eigenvalues, so that $\Delta < 0$

$$(\chi - \phi)^2 < 4\left(\phi\chi - \frac{\varrho v}{N}\right)$$

Important discussion points:

The relationship between initial conditions and steady state can be a source of divergence between Y_m and N_m. That is an important element. However, we observe a situation in which different regions, starting from similar initial conditions, manage to result in quite different patterns.

The system may not be in its stable part. That is a possibility that is unsustainable in the long-run. While we admit that the system might find moments of short-term instability, we will stick our analysis to the stable part of the model.

Furthermore, it could be part of a cyclical adjustment, that is in principle a possibility. However, as we are looking at a very consistent pattern of divergence, we consider that the system did not reach that specific condition.

We consider that there is an autonomous growth of manufacturing, in which employment in manufacturing will never be zero in the steady state and in which demand acts as a multiplier.

6. Development patters three stylized economies (Incomplete)

6.1. Premature Deindustrialization (Latin America)

In order to follow a premature deindustrialization patter, we observe the following condition: a steady state below initial conditions for both $K_0 > K^*$ and $N_{m_0} > N_m^*$. That would imply the following conditions.

$$K_0 = N_{m0} = 1$$

$$K^* = -\frac{\varrho}{\phi}\left(\frac{1}{N}\right)\frac{-\theta}{\left(\chi - \frac{\nu\varrho}{\phi N}\right)} < 1$$

$$N_m^* = \frac{-\theta}{\left(\chi - \frac{\nu\varrho}{\phi N}\right)} < 1$$

Simulation 1:

6.2. Catching-up (East Asia)

Condition: steady state above initial conditions for both $K_0 < K^*$ and $N_{m_0} < N_m^*$

$$K_0 = N_{m0} = 1$$

$$K^* = -\frac{\varrho}{\phi}\left(\frac{1}{N}\right)\frac{-\theta}{\left(\chi - \frac{\nu\varrho}{\phi N}\right)} > 1$$

$$N_m^* = \frac{-\theta}{\left(\chi - \frac{\nu\varrho}{\phi N}\right)} > 1$$

Simulation 2:

6.3. Divergence (Africa)

In order to reach divergence ($K_0 < K^*$ and $N_{m0} > N_m^*$), the following conditions must be met:

$$K^* = -\frac{\varrho}{\phi}\left(\frac{1}{N}\right)\frac{-\theta}{\left(\chi - \frac{\nu\varrho}{\phi N}\right)} > 1$$

$$N_m^* = \frac{-\theta}{\left(\chi - \frac{\nu\varrho}{\phi N}\right)} < 1$$

$$K^* = -\frac{\varrho}{\phi}\left(\frac{1}{N}\right)N_m^* > 1$$

That implies the following condition:

$$0 < \frac{\varrho}{\phi} < \frac{N\chi}{\nu}$$

Sensitivity of investment to employment rate must be low compared to the sensitivity of investment to the level of capital stock – investment does not react to capacity, and demand is not reacting fast enough to changes in supply in a system in which employment in manufacturing is still at a low, initial level, in which it is not yet that hard to increase employment, while workers struggle to move to manufacturing (lack of skills).

Next Steps: Simulation 3 (To be defined):

ϱ	Sensitivity of investment to employment rate (in the manufacturing sector).	$\varrho > 0$ A higher employment rate.
ϕ	Sensitivity of investment to the level of capital stock.	$\phi < 0$ Decreasing, as more capital stock makes it harder to keep the pace of investment increases.
χ	Sensitivity of manufacturing employment to itself.	$0 < \chi < 1$ More difficult to increase employment when it is high.
ν	Sensitivity of manufacturing employment to the level of capital in manufacturing	$\nu > 0$ More capital suggests more employment opportunities for workers to move to manufacturing. However, those workers must have the skills.

7. Conclusion

In this article we presented a Kaldorian framework in order to provide an explanation to the observation of manufacturing divergence in Africa.

Our results point to the direction that SSA has a particular position that is in the origin of this divergence. That is a position in which (1) demand responds slowly (if any) to changes in supply, so that an increases in capacity do not create a strong response by investments; (2) employment in manufacturing is still at a low initial value, which in principle would give opportunities to quickly expand manufacturing activities while (3) workers, for a number of reasons, struggle to move towards manufacturing. That points to the lack of strength of a capitalist entrepreneur class to invest and create employment opportunities, and to a strong difficulty of the working class to move towards manufacturing activities – lack of training, skills. Productivity in manufacturing rises and employment is expelled to services.

The article is still incomplete, and after developing the theoretical model we aim at calibrating it to each of the three scenarios (Premature deindustrialisation, Catching-up and manufacturing divergence).

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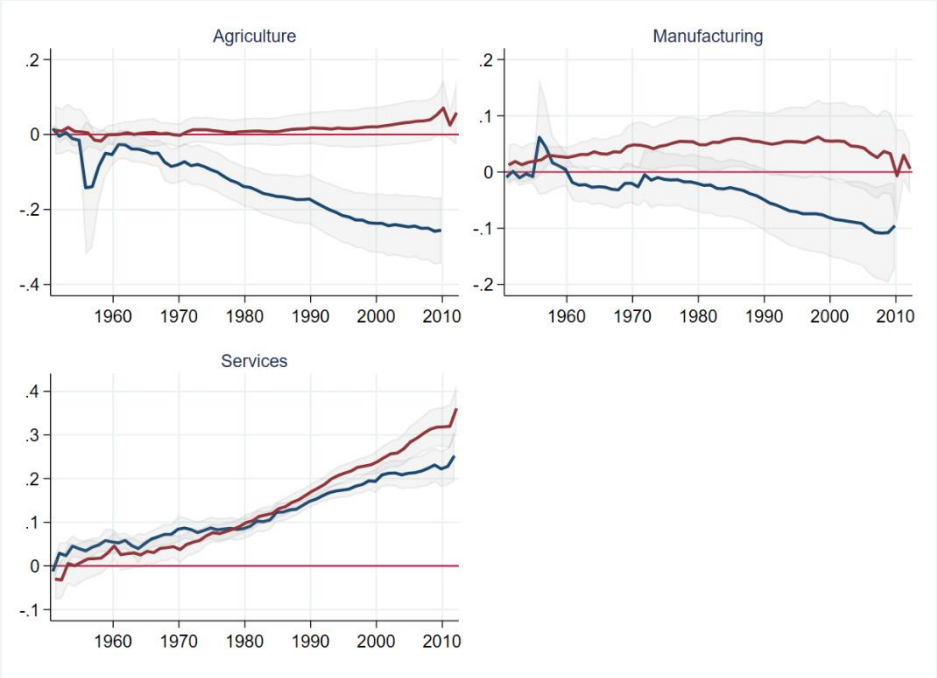
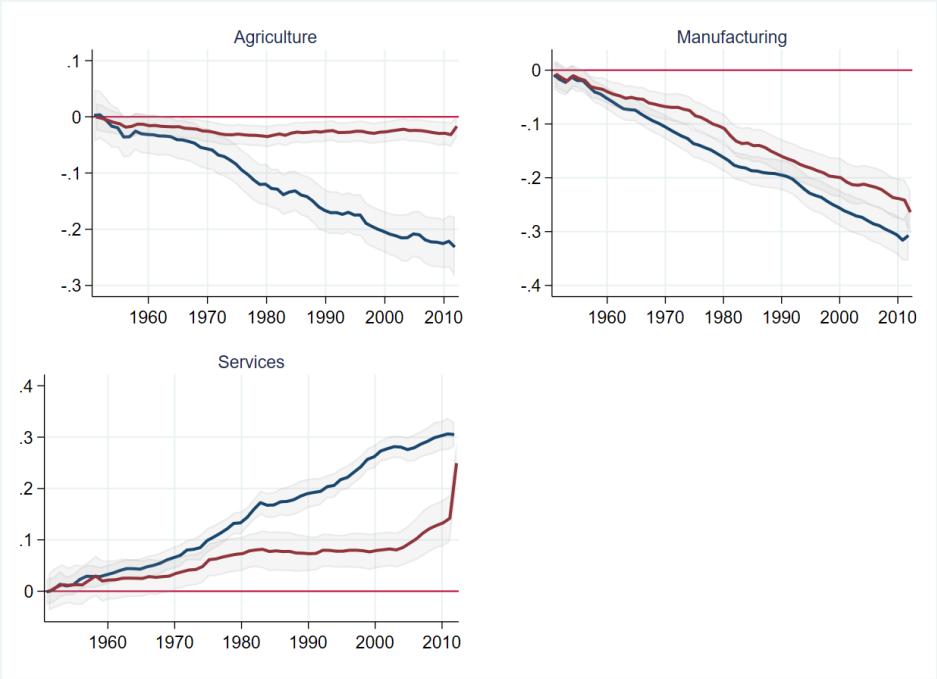
Appendix.

Figure A1. Value Added and Employment data for Asia



In red: sectoral Value Added. In blue: sectoral employment. Source: Own Elaboration

Figure A2. Value Added and Employment data for Latin America



In red: sectoral Value Added. In blue: sectoral employment. Source: Own Elaboration