

Working Paper

CEsA CSG 198/2024

THE RELEVANCE OF THE CONCEPT OF CUMULATIVE CAUSATION: UNDERSTANDING GROWTH TRAJECTORIES IN SUB-SAHARAN AFRICA

Alice Nicole SINDZINGRE

ABSTRACT

Differences in growth trajectories among countries – including the possibility of divergence –, are a central issue in economics. Mainstream economics explain growth processes via varieties of neoclassical models, even improved with concepts such as institutions. Yet such models have difficulties in providing accurate accounts of the growth trajectories of many developing countries, notably low-income ones. It is argued that the growth paths of low-income countries are more appropriately explained by the theoretical framework that relies on the nexus of concepts of cumulative causation, non-linearities, threshold effects, self-reinforcing processes, irreversibility, path dependence and traps – though this approach remains marginal in mainstream economic analyses of growth and development. Firstly, this nexus of concepts is a powerful framework concerning the possibility and explanation of dynamic divergence regarding growth between countries, as it exhibits properties such as: the possibility of cumulative, dynamically self-reinforcing, processes; the existence of thresholds and tipping points; multiple equilibria. Secondly, cumulative causation, by definition, involves a combination of causes: its conceptual framework allows for the integration of several dimensions – economic, political, social, cognitive –, whose combination results in either virtuous or vicious circles. In developing countries, these causes (and their coalescence) typically consist in economic structures (e.g., commodity-based export markets), political institutions and social norms (predatory regimes, high inequality) as well as types of public policies.

Keywords CUMULATIVE CAUSATION, SUB-SAHARAN AFRICA, GROWTH TRAJECTORIES, LOW-INCOME COUNTRIES.

AUTHOR:

Alice Nicole SINDZINGRE

Paris-North Economics Centre (CEPN), University Paris-North; CEaA (Centre for African and Development Studies, Lisbon School of Economics and Management - ISEG, University of Lisbon). Previous versions of this paper have been presented at the CEaA Research Seminar ('CEaA Thinks'), Lisbon, 2 November 2022; and at the European Association for Evolutionary Political Economy (EAEPE) 35th Annual Conference, Leeds, 13-15 September 2023. The author thanks Alexandre Abreu, Vincent Agulonye, John Hall, and Wolfram Elsner for their very relevant comments.

Working Paper CEsA CSG 198/2024

ISSN: 2975-9692

CEsA neither confirms nor informs any opinions expressed by the authors in this document.

CEsA is a research Centre that belongs to [CSG/Centre for Research in Social Sciences and Management](#), which is hosted by ISEG - Lisbon School of Economics and Management, Universidade de Lisboa, a school dedicated to teaching and research which was founded in 1911. In 2015, CSG was the object of the international evaluation process of R&D units carried out by the Portuguese national funding agency for Science, Research, and Technology (FCT - Foundation for Science and Technology), resulting in being ranked as "Excellent". Founded in 1983, CEsA is a non-profit private institution, whose research team is composed of ISEG faculty, full-time research fellows, and faculty from other higher education institutions. Its object is the study of economic, social, and cultural development in developing countries in Africa, Asia, and Latin America, although it places particular emphasis on the study of African Portuguese-speaking countries, China, and Pacific Asia, as well as Brazil and other Mercosur countries. Additionally, CEsA also promotes research on other theoretical or applied topics in development studies, including globalisation and economic integration in other regions, either generally or across several regions. From a methodological point of view, CEsA has always sought to foster a multidisciplinary approach to the phenomenon of development, and a permanent interconnection between the theoretical and applied aspects of research. Furthermore, the Centre pays particular attention to the organization and expansion of research-supporting bibliographic resources, the acquisition of databases, and publication exchange with other research centres.

More Working Papers CEsA/CSG available at:

<https://cesa.rc.iseg.ulisboa.pt/publicacoes/working-papers/>

CEsA – Centro de Estudos sobre África e Desenvolvimento (CSG/ISEG/ULisboa)

Rua Miguel Lupi 20, 1249-078 Lisboa

+351 21 392 5983

cesa@cesa.iseg.ulisboa.pt

INDEX

1. INTRODUCTION
2. THE DEBATES ON DIVERGENCE
 - 2.1 *THE ISSUE OF 'BIG TIME'*
 - 2.2 *YET, DIVERGENCE REMAINS A DEBATED ISSUE*
3. GROWTH PATHS: KEY MAINSTREAM 'BASICS'
 - 3.1 *MAINSTREAM MODALITIES OF CAUSATION*
 - 3.2 *MAINTAINING THE FRAMEWORK VIA THE ABSORPTION OF CONCEPTS FROM OTHER SOCIAL SCIENCES*
4. EXPLAINING GROWTH TRAJECTORIES: THE RELEVANCE OF THE CONCEPT OF CUMULATIVE CAUSATION
 - 4.1 *CUMULATIVE CAUSATION WITH HETEROGENEOUS CAUSALITIES*
 - 4.2 *CUMULATIVE AND MULTIPLE CAUSATIONS: CONTRASTING REGIONS, E.G., EAST ASIA AND SSA*
5. CONCLUSION

FIGURE INDEX

Figure 1 – GDP per capita, selected regions, 1820-2018

Figure 2 – GDP per capita, SSA vs. the world, constant 2015 US\$, 1960–2022

Figure 3 – GDP per capita, world, selected regions, United States, 1960–2022 (constant 2015 US\$)

Figure 4 – The difficulty of ‘middle-income transition’: GDP per capita (constant 2015 US\$), various countries, 1960-2022

Figure 5 – Rate of growth of world population, selected regions, 1-2001 (annual average growth rates)

Figure 6 – Share of merchandise exports in world exports, selected regions, 1948-2022 (percent)

Figure 7 – SSA exports: percentage of world exports (right axis) and value (left axis), bn US\$ (current prices), 1948-2022

Figure 8 – Manufacturing value added (% of GDP), Korea and SSA, 1960-2022

Figure 9 – Rwanda and Ethiopia, GDP per capita (constant 2015 US\$), 1960-2022

Figure 10 – SSA, selected countries, GDP per capita (constant 2015 US\$), 1960-2022

Figure 11 – SSA and world, GDP per capita annual growth rates, 1960-2022

Figure 12 – SSA GDP per capita (constant 2015 US\$) (left axis), GDP growth and GDP per capita growth rates (right axis), 1960-2022

Figure 13 – SSA growth rate (right scale) and commodity prices (annual price index, real 2010 US dollars, left scale), 1960-2022

Figure 14 – SSA growth rate (right scale) and commodity prices (annual price index, real 2010 US dollars, left scale), 1960-2022

1. INTRODUCTION

Differences in income and growth trajectories among countries – including the possibility of divergence –, and their explanations, are a central issue in economics. There is now some consensus, e.g., in growth economics or economic history, that non-economic phenomena may contribute to this divergence. Mainstream economics, however, often explain growth processes via varieties of neoclassical models, even if the recognition of endogenous growth and the key role of innovation, as well as that of institutions, may be viewed as improvements to these models. Yet, such models have difficulties in providing accurate accounts of the growth trajectories of many developing countries, notably low-income ones.

It is argued here that growth paths of low-income countries are more appropriately explained by the theoretical framework that relies on the nexus of concepts of cumulative causation, non-linearities, threshold effects, self-reinforcing processes, irreversibility, path dependence and traps. Surprisingly, and significantly, this approach remains relatively marginal in mainstream economic analyses of growth and development processes – despite relevant studies that puzzlingly had a limited impact on further mainstream research (e.g., Azariadis and Stachurski, 2005; Barrett and Swallow, 2006).

Firstly, this nexus of concepts is a powerful framework concerning the possibility and explanation of dynamic divergence regarding growth or income between countries, as it exhibits properties such as: the possibility of cumulative, dynamically self-reinforcing, processes; the existence of thresholds and tipping points; and multiple equilibria. Secondly, cumulative causation involves, by definition, a combination of causes: the conceptual framework of cumulative causation allows for the integration of several dimensions – economic, political, social, cognitive –, whose combination results in the building of virtuous, or, on the contrary, vicious circles. In developing countries, these causes (and their coalescence) typically consist in economic structures (e.g., commodity-based export markets), political institutions, regimes and social norms ('weak' institutions, predatory regimes, high inequality) as well as types of public policies.

The framework of cumulative causation has thus an encompassing explanatory power regarding key questions of economics – e.g., what explains countries' growth trajectories, what are the best policies for fostering long-term growth? It not only better explains the long-term stagnation of low-income economies, or the growth of others (e.g., how the nexus institutions-public policies, and their credibility and legitimacy for citizens, has driven the growth of 'developmental states' in East Asia). In addition, such a conceptual framework has the crucial quality of enabling the integration of diverse concepts built by social sciences – economics, political science, sociology, history, or psychology. Moreover, the framework of cumulative causation allows for causal processes to be flexible and inclusive, to be singular (linked to contexts, time and space), to vary with time, and to be triggered by events that not only may not be strictly 'economic' but may

also be minor or ex ante unpredictable: in a cumulative causation perspective, large effects may be caused by 'small events' (Arthur, 1994a; David, 2000). Causation is here inherently complex – complexity economics has indeed demonstrated the greater epistemic power of this approach (Arthur, 2015; Elsner et al., 2014).

The article is structured as follows. Firstly, it empirically discusses the possibility of divergence between regions and countries, as well as the related theoretical debates. Secondly, it questions the mainstream explanations of growth trajectories: notably the limitations stemming from the pre-eminence of the conceptual framework of equilibrium, as well as the limitations of modelling in the apprehending of causation and consideration of other social sciences. Then it presents the concept of cumulative causation. Finally, it shows the relevance of this concept for the explanation of growth trajectories via the stylised examples of Sub-Saharan Africa vs. East Asian economies.

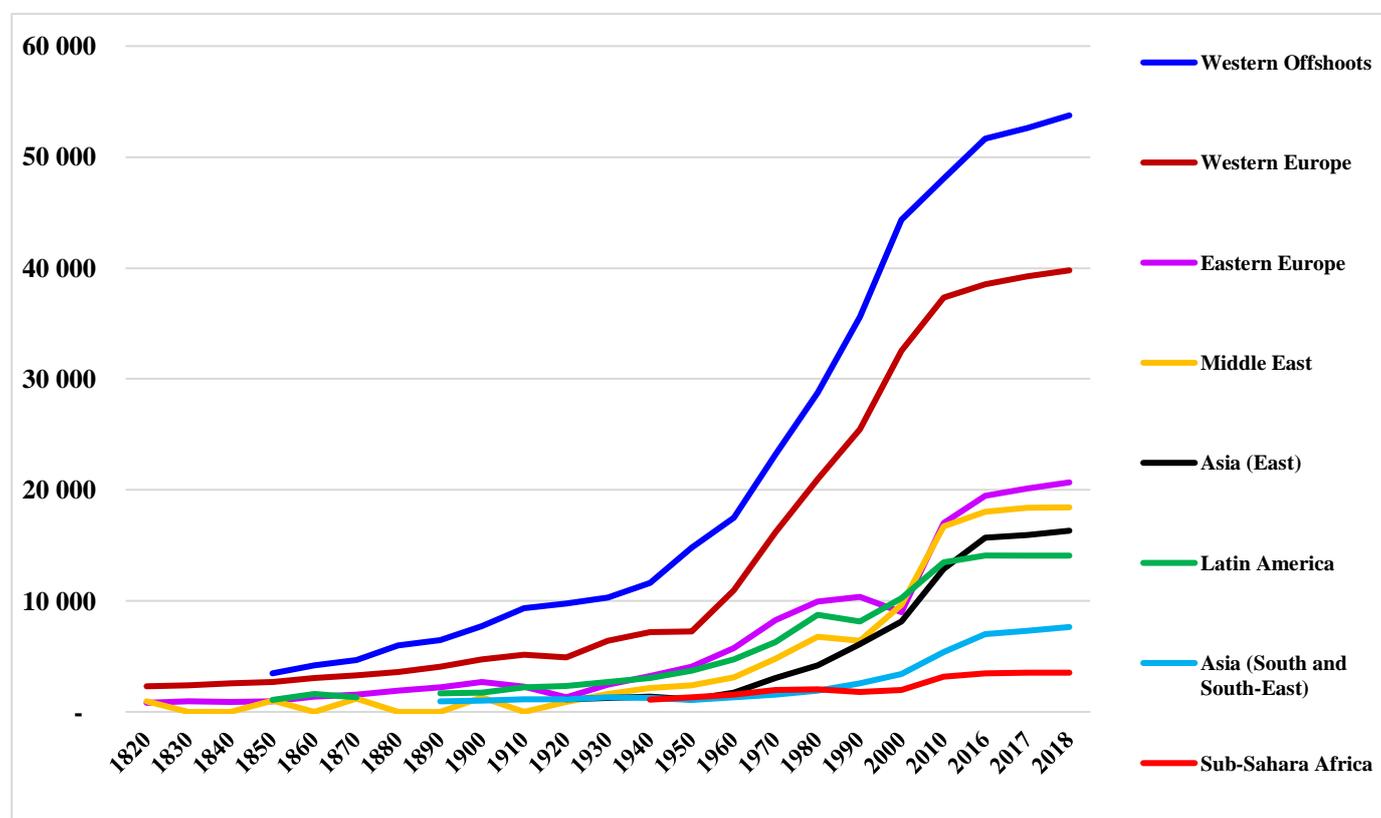
2. THE DEBATES ON DIVERGENCE

As shown by Abramowitz' (1986) theory of 'catch-up' effect, productivity levels and therefore in fine income levels should converge across countries, despite, however, variations in the rate of convergence across periods. According to the neoclassical Solow model, growth is driven by the accumulation of physical capital, and, departing with low levels of physical capital, poorer economies with lower per capita incomes should experience faster growth rates than wealthier ones.

2.1 THE ISSUE OF 'BIG TIME'

The 'catch-up' theory has been challenged by the empirical evidence showing that low-income countries may exhibit low growth rates, and that regions or countries may in fact be characterised by 'clubs of convergence', with groups of countries not only displaying different patterns of growth, but also appearing to diverge (Durlauf and Johnson, 1995). The countries that genuinely achieved sustained growth may be fewer than the others. In particular, over the long-run, there seems to have been a divergence between the regions of Europe, Asia and Africa – the 'great divergence' debated by Pomeranz (2000) and other researchers in global economic history. Similarly, national data show that global inequality has steadily increased over the past 200 years (Milanovic, 2016).

Figure 1: GDP per capita, selected regions, 1820-2018



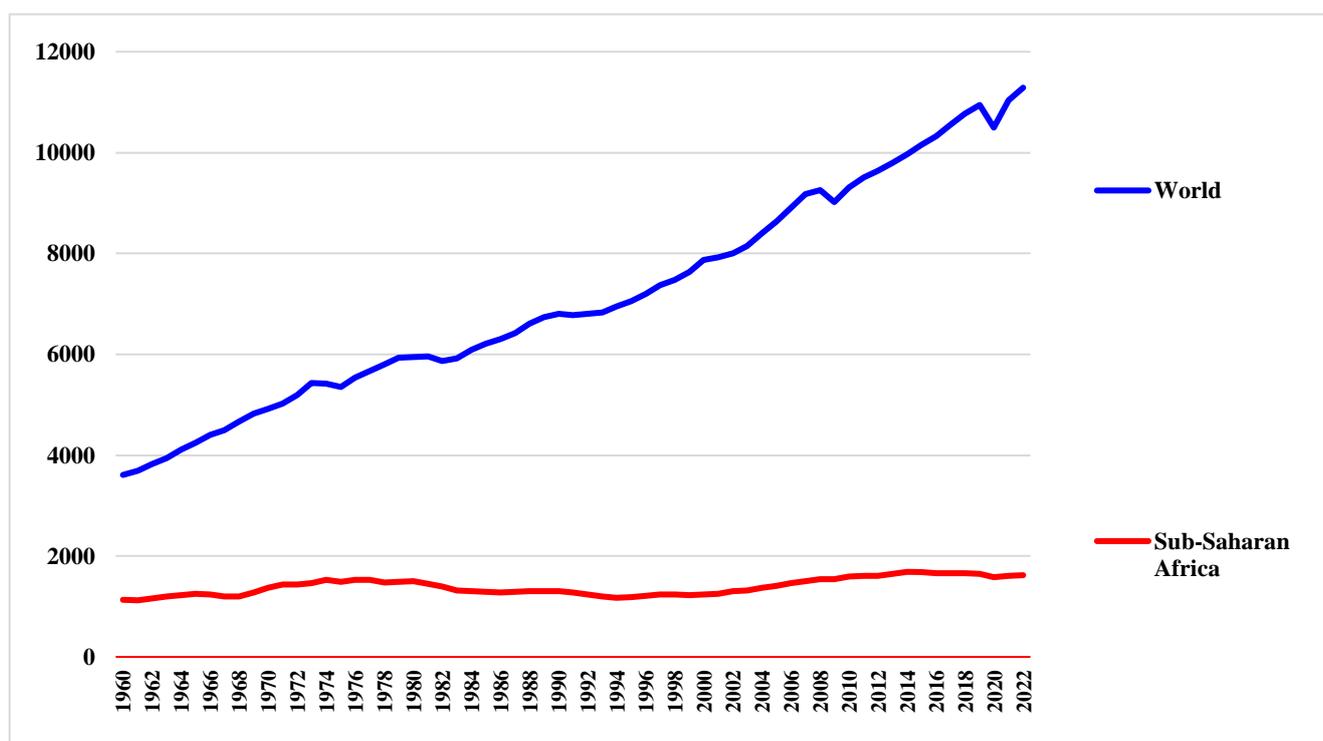
Source: Angus Maddison database, 2020 version: <http://www.ggdcc.net/maddison:https://www.rug.nl/ggdcc/historicaldevelopment/maddison/releases/maddison-project-database-2020>. 2011 dollars. Western Offshoots: USA, Australia, Canada, New Zealand.

The extensive literature on economic history has highlighted many potential factors influencing the trajectories of 'Western regions': e.g., beyond Pomeranz's arguments regarding the key role of coal, the existence of institutions fostering efficiency in the use of technology and innovation (Clark, 2007) or higher total factor productivity (Clark and Feenstra, 2001). For Maddison (2001), Western growth profiles can be explained by three interactive processes: conquest of fertile land; international trade and capital movements, and technological and institutional innovation. Similarly, the substantial and persistent difference in productivity levels between developed and developing countries – the 'convergence gap' –, has been emphasised by Rodrik (Rodrik, 2011), who argues that convergence hinges on structural change, e.g., the expansion of tradables such as manufacturing and modern services. As summarised by Court (2020), the vast literature on divergence identifies the 'deep' determinants of economic development as falling into three categories: biogeography (climate, natural endowments, etc.); culture and institutions; and contingency-and-conjuncture (accidental events such as the Black Death, European political fragmentation, colonialism).

Sub-Saharan Africa (SSA) appears to have experienced divergence throughout the 19th century. Research, including long-term historical studies, highlights as a key causal sequence underlying this divergence the dependence of SSA on the production and export of primary commodities, and, as commodity prices are inherently volatile, the negative impact on growth of this volatility, as well as its negative impact on these countries' terms of trade (Blattman et al., 2007).

In this context, SSA income performance seems to diverge from other parts of the world.

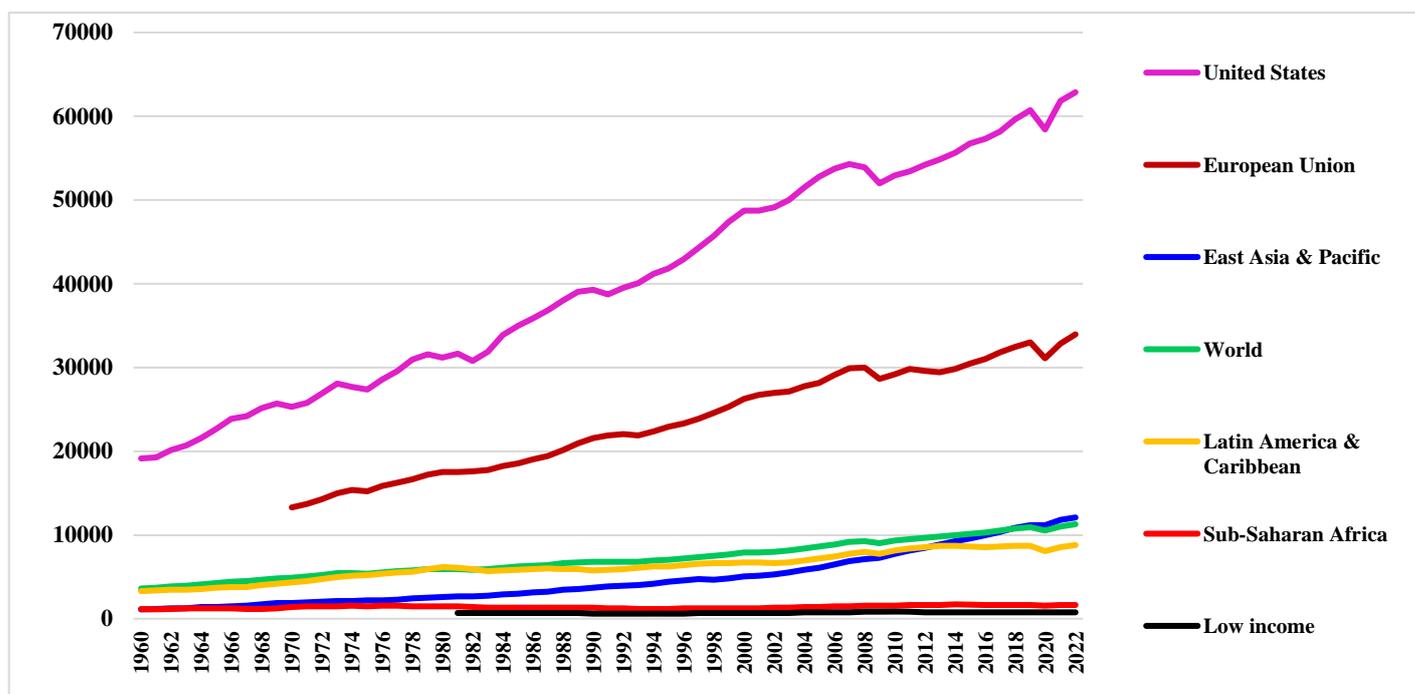
Figure 2: GDP per capita, SSA vs. the world, constant 2015 US\$, 1960–2022



Source: World Bank World Development Indicators database, August 2023.

The figure above must be put in the context of the other regions of the world. The figure below thus shows that SSA performance is driven by low-income countries, as most low-income countries are in SSA.

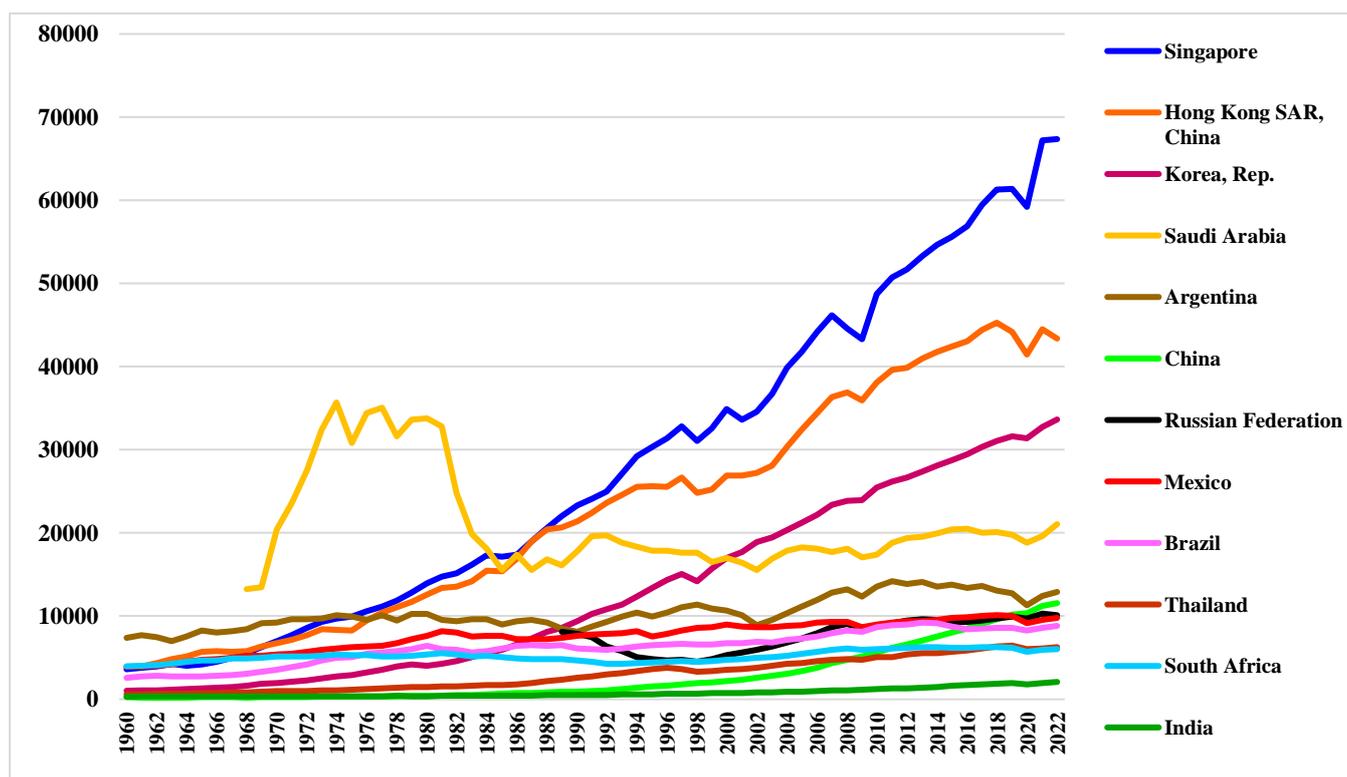
Figure 3: GDP per capita, world, selected regions, United States, 1960–2022 (constant 2015 US\$)



Source: World Bank World Development Indicators database, August 2023.

The divergence observed in the late 20th century originated from the take-off in East Asia and its ‘developmental states’ – namely Japan, South Korea, Taiwan, Hong Kong, Singapore, and China. Many other middle-income countries did not experience similar economic performances, and it may be argued that these states constitute a specific group. Progressing from the status of a low-income to a middle-income country does not guarantee further advancement to that of a high-income country.

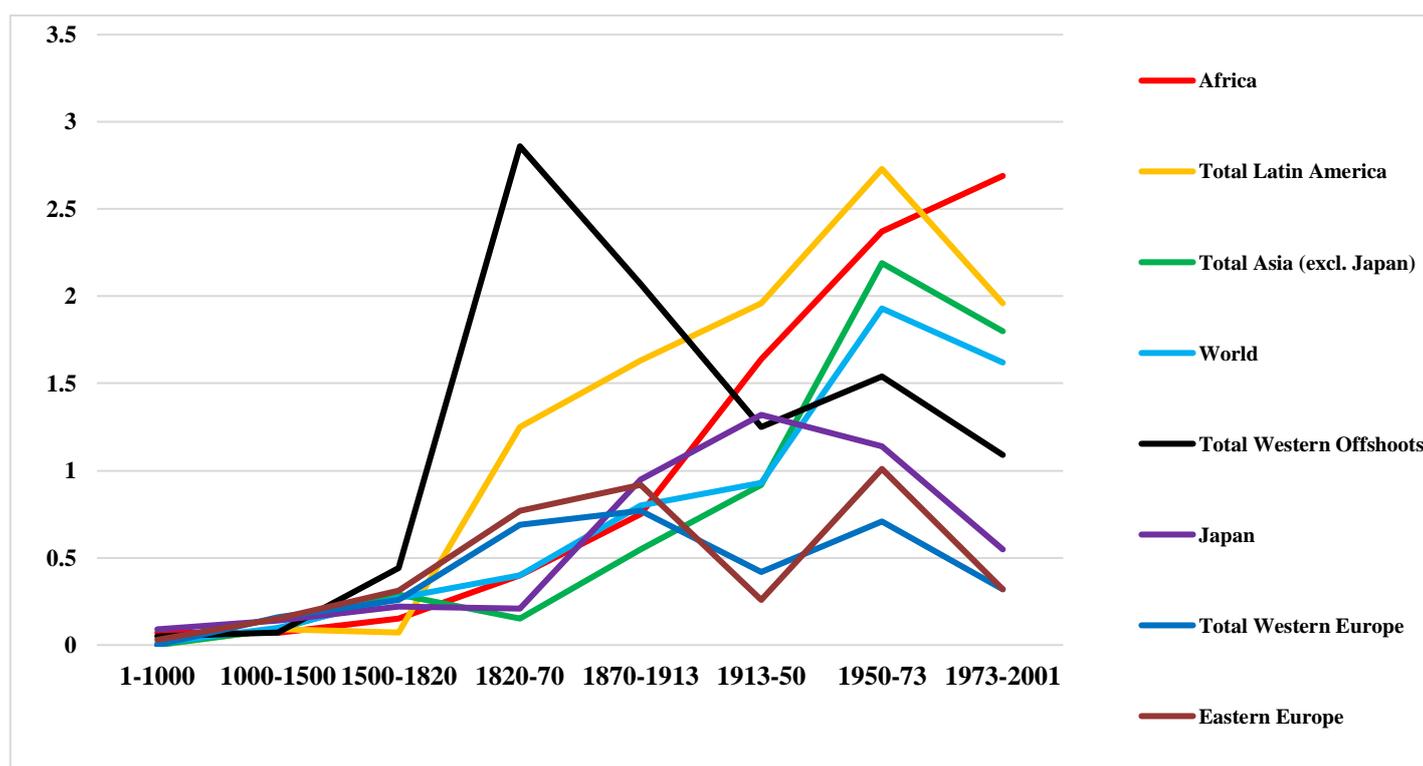
Figure 4: The difficulty of ‘middle-income transition’: GDP per capita (constant 2015 US\$), various countries, 1960-2022



Source: World Bank World Development Indicators database, August 2023.

Demography plays a significant role in processes of divergence, and indeed, the growth path of the SSA region is influenced by demography. The demographic transition, i.e., reduced fertility rates and population growth, has enabled economies to ‘convert a larger share of the fruits of factor accumulation and technological progress into growth of income per capita’ (Galor, 2005). The population of SSA continues to grow at a rate that remains higher than in other regions, perpetuating a Malthusian trap in some countries (Galor, 2011).

Figure 5: Rate of growth of world population, selected regions, 1-2001 (annual average growth rates)



Source: Maddison (2003), table 8a (note: it refers to Africa, not SSA).

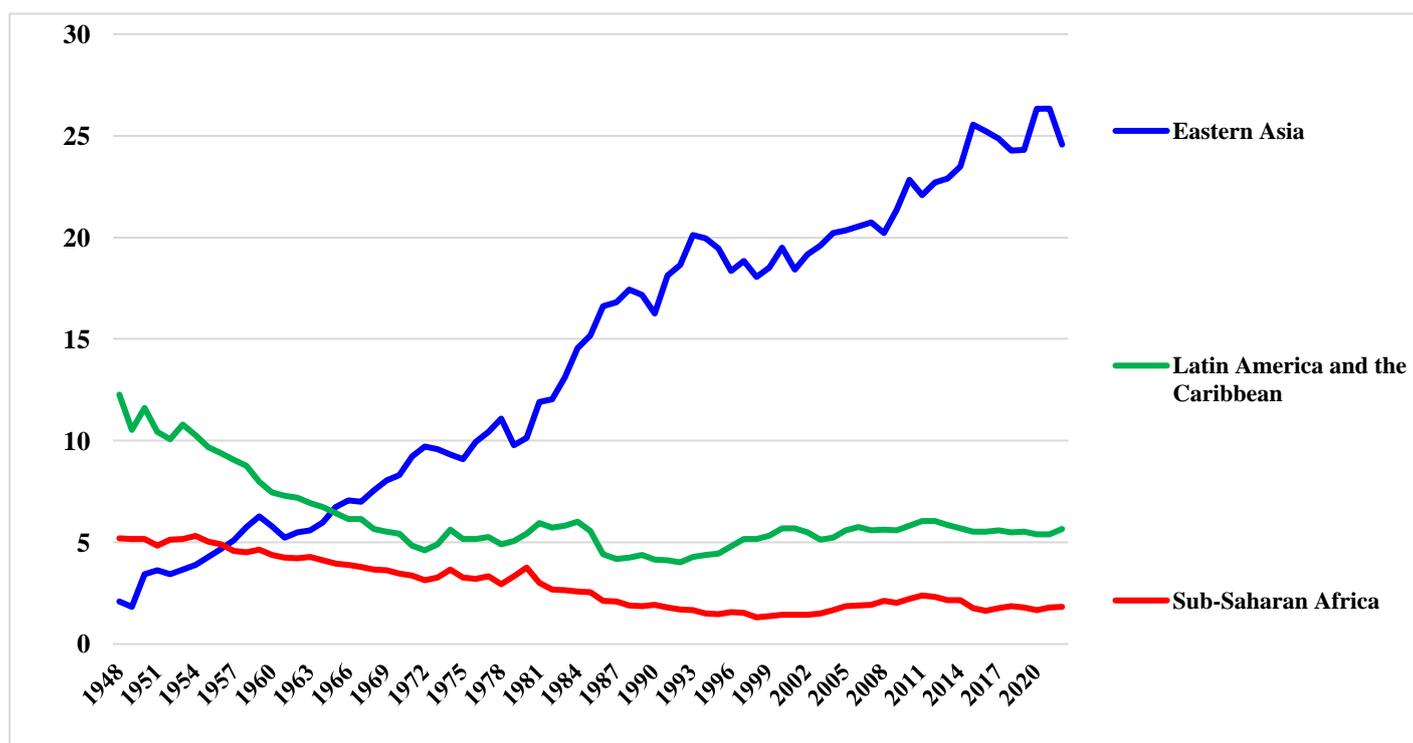
Regions also differ in terms of geography, for example, regarding characteristics such as being landlocked or coastal, small or large. As shown by economic geography, these characteristics shape the movement of people and the dissemination of goods and ideas, they may either favour or impede such movement and dissemination, and they may have been historical factors contributing to divergence (Diamond, 1997). Malthusian traps typically involve both demography and geography. ‘Unified growth theories’ advocated by Galor (2011) and others have particularly emphasised the key roles of the timing of demographic transitions as factors of divergence, as well as that of land inequality and its impact on human capital accumulation. As demonstrated by Galor and Weil (2000), the transition from stagnation to growth may occur via a technological progress that is driven by education and population size, which can arise arbitrarily and generate an endogenous disappearance of the mechanisms of Malthusian stagnation.

Indeed, the African continent is in fact very large, and this geographic characteristic has significant economic and political implications, notably regarding a state’s capacity to collect taxes and consequently to build

infrastructure, the effectiveness of public policies, and hence, in a circular causation, state capacity itself (see annex).

Equally, endowments ('initial conditions') matter – in combination with the capacity to transform them, via public policies or other means. SSA is characterised by a lack of structural transformation and a dependence on primary commodities that have persisted throughout the 20th century, even after the wave of independence from the late 1950s onwards. In most SSA economies, primary commodities represent more than 80% of exports (UNCTAD, 2023, fig.1). This may be viewed as a key factor of divergence. SSA's commodity-based distorted export structure explains the consistent decline of the region's share in world exports and has generated a divergence regarding this share in world exports.

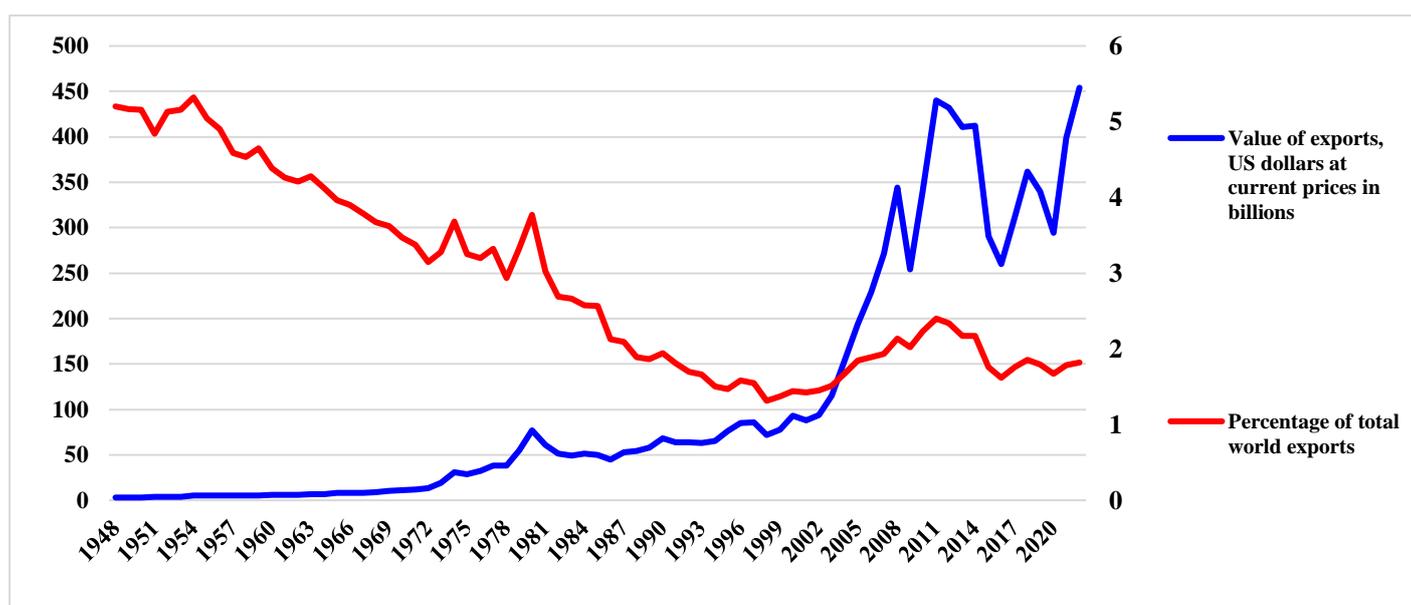
Figure 6: Share of merchandise exports in world exports, selected regions, 1948-2022 (percent)



Source: UNCTAD Statistics: <http://unctadstat.unctad.org>, October 2023.

The value of SSA exports has increased, albeit less than the value of exports of other countries.

Figure 7: SSA exports: percentage of world exports (right axis) and value (left axis), bn US\$ (current prices), 1948-2022

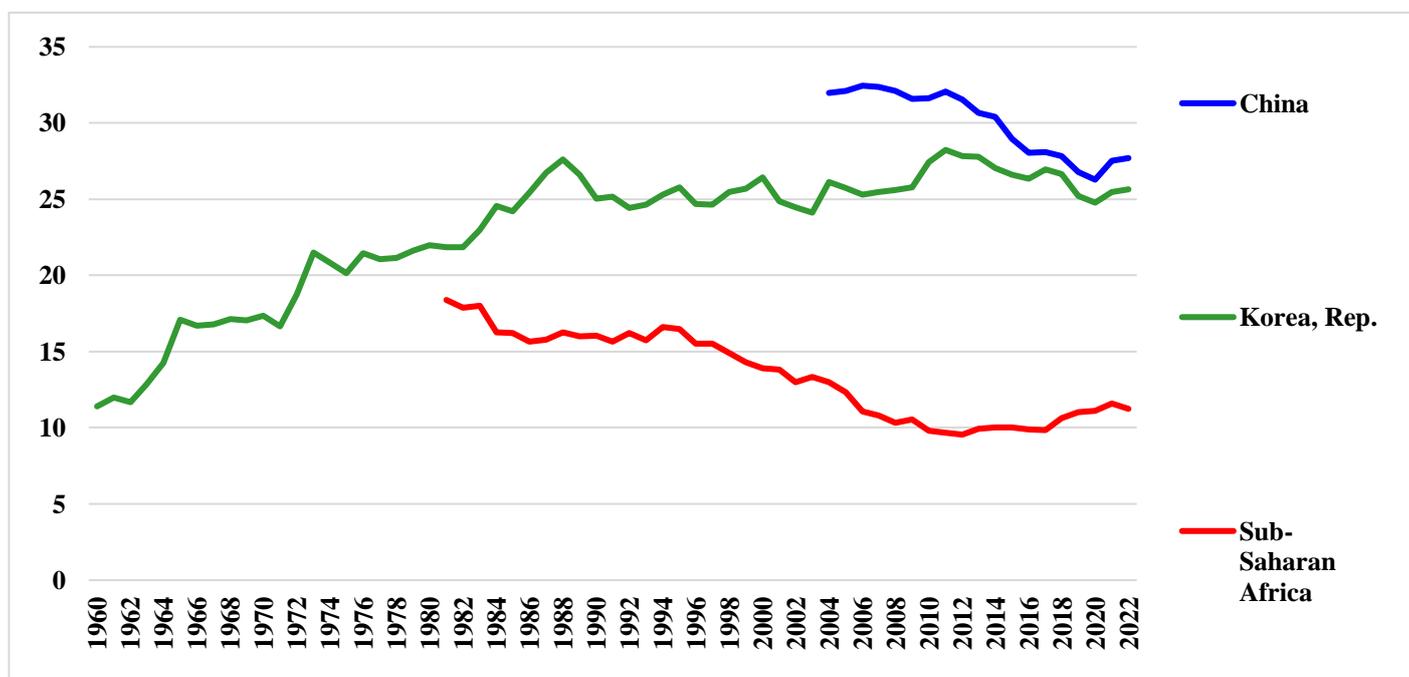


Source: UNCTAD Statistics: <http://unctadstat.unctad.org>, October 2023.

Manufacturing value added (MVA), an important indicator of structural change and indeed a driver of Asian economies' performance, has also consistently declined for SSA. This indicator, however, holds true for the initial stages of the process, as the evolution of countries' economic trajectories over the 20th century has shown that after reaching a certain threshold of GDP per capita, many economies enter a phase of deindustrialisation. China's MVA, for instance, has been decreasing between 2011 and 2020.

It could be argued that SSA is undergoing a process of deindustrialisation as most other parts of the world. As shown by Rodrik (2016), however, even if services have gradually replaced manufactures in many countries, for SSA this process may be a 'premature deindustrialisation'. Indeed, industrialisation cannot be reduced to indicators like MVA or exports: it encompasses holistic dynamics that involve entire economies and societies – employment, labour relations, economic and political institutions, education, among many others.

Figure 8: Manufacturing value added (% of GDP), Korea and SSA, 1960-2022



Source: World Bank World Development Indicators database, August 2023.

The key point is that all the above views typically emphasise the existence of combination of causes and cumulative causation processes.

2.2. YET, DIVERGENCE REMAINS A DEBATED ISSUE

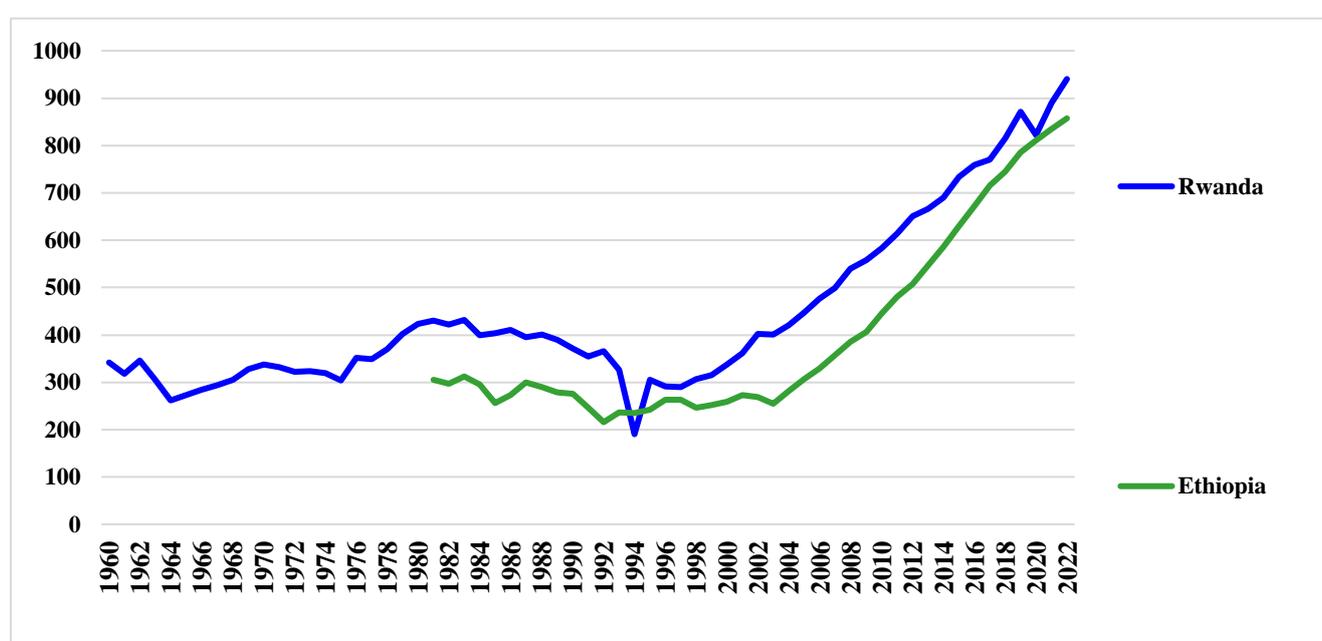
Such divergence remains an interpreted fact, and there may be a 'half-full' or 'half-empty glass' perspective: one may either focus on the take-off of one group of countries, notably in East Asia, or, in contrast, on the stagnation of other groups of countries, notably in SSA.

In particular, modalities of measurement matter. Growth can be analysed through the two different notions of growth rates and changes in levels of income. Levels of incomes do not present the same countries' profiles and performances as growth rates do. One may choose to focus on growth rates. In SSA, the growth rates of some countries are, for example, driven by energy prices (e.g., oil), while some developed countries appear as laggards. However, their growth as measured by the change in levels of GDP per capita may be very small.

These two notions, growth rates and levels of incomes, offer different perspectives on the determinants of growth, notably when considering different time spans. The countries with the greatest percentage increase

in GDP per capita differ from the countries that have experienced the greatest growth measured by change in levels of GDP per capita. Large percentage changes on a small base can obscure small absolute changes. Additionally, presenting performance in isolation vs. alongside other countries suggests different pictures, even when considering the same indicator such as per capita income. For instance, within SSA, Ethiopia and Rwanda are often cited as examples of impressive improvements in per capita incomes.

Figure 9: Rwanda and Ethiopia, GDP per capita (constant 2015 US\$), 1960-2022



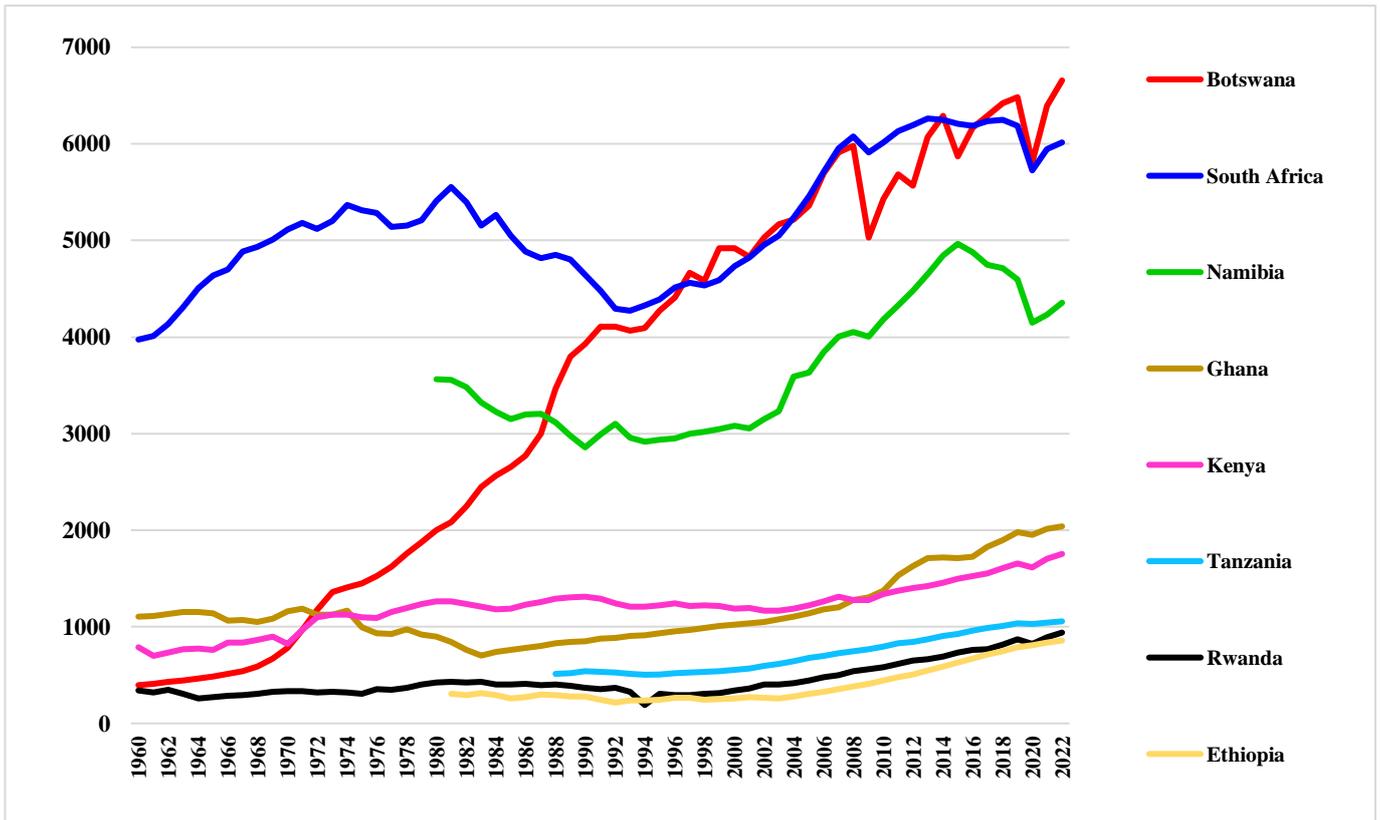
Source: World Bank World Development Indicators database, August 2023.

However, a comparison, even limited to other SSA countries, ‘flattens’ this performance.

Equally, SSA is certainly a very aggregate notion, and there may even be a possible divergence within SSA economies (a ‘V’ shape), with the two economies of South Africa and Botswana exhibiting specific trajectories. Setting aside South Africa, an emerging economy with a unique history, Botswana’s spectacular and steady growth over six decades shows the possibility of a ‘half full glass’ perspective, notably a divergence that is not a deterministic process even if a country has cumulated many characteristics that are often cited as key factors of stagnation, e.g., the dependence on very few primary commodities for exports. Botswana’s exports are indeed essentially based on diamonds (more than 70% of exports in 2021¹).

¹ Source: Harvard Growth Lab’s Atlas of Economic Complexity: <https://atlas.cid.harvard.edu/countries/37/export-basket>

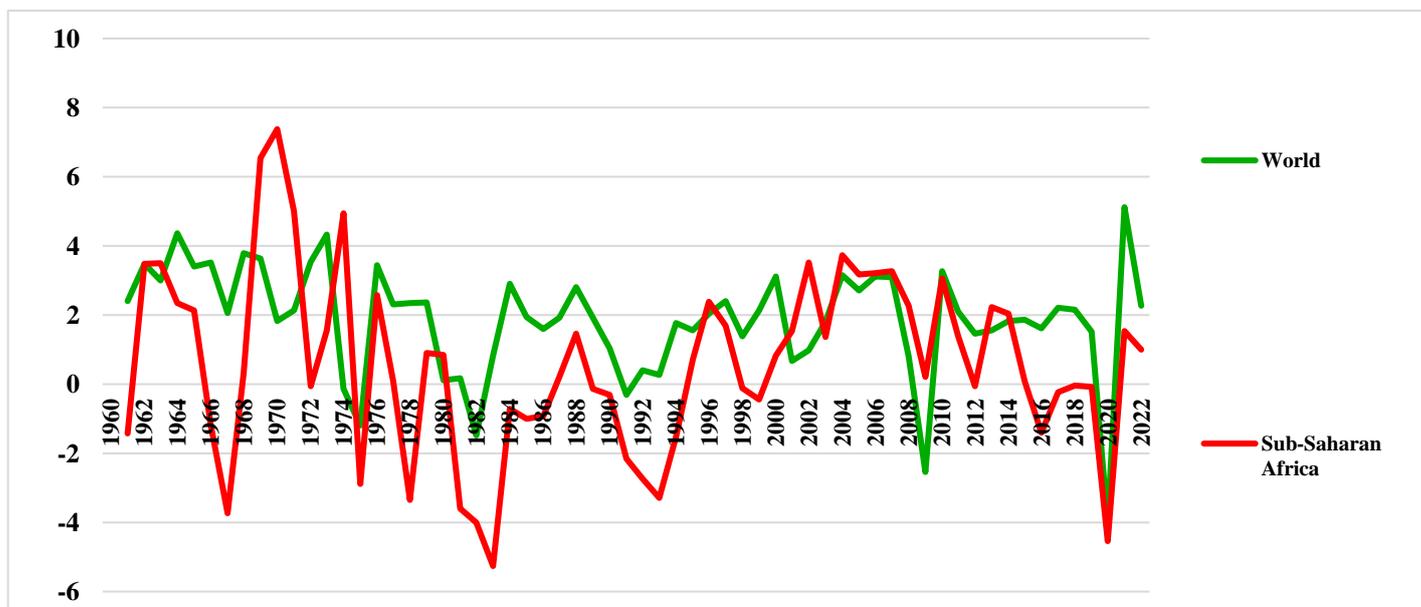
Figure 10: SSA, selected countries, GDP per capita (constant 2015 US\$), 1960-2022



Source: World Bank World Development Indicators database, August 2023.

In addition, the issue of divergence remains questioned at the conceptual level. These differences in growth trajectories may be seen as a ‘non-issue’. Growth rates are typically fluctuating and volatile, both in SSA and in all countries. For example, concepts of cycles, or those of ‘growth acceleration’ or ‘deceleration’ (or ‘growth collapse’) may be considered as more relevant explanations of countries’ growth trajectories (Hausmann et al., 2005; Hausmann et al., 2006).

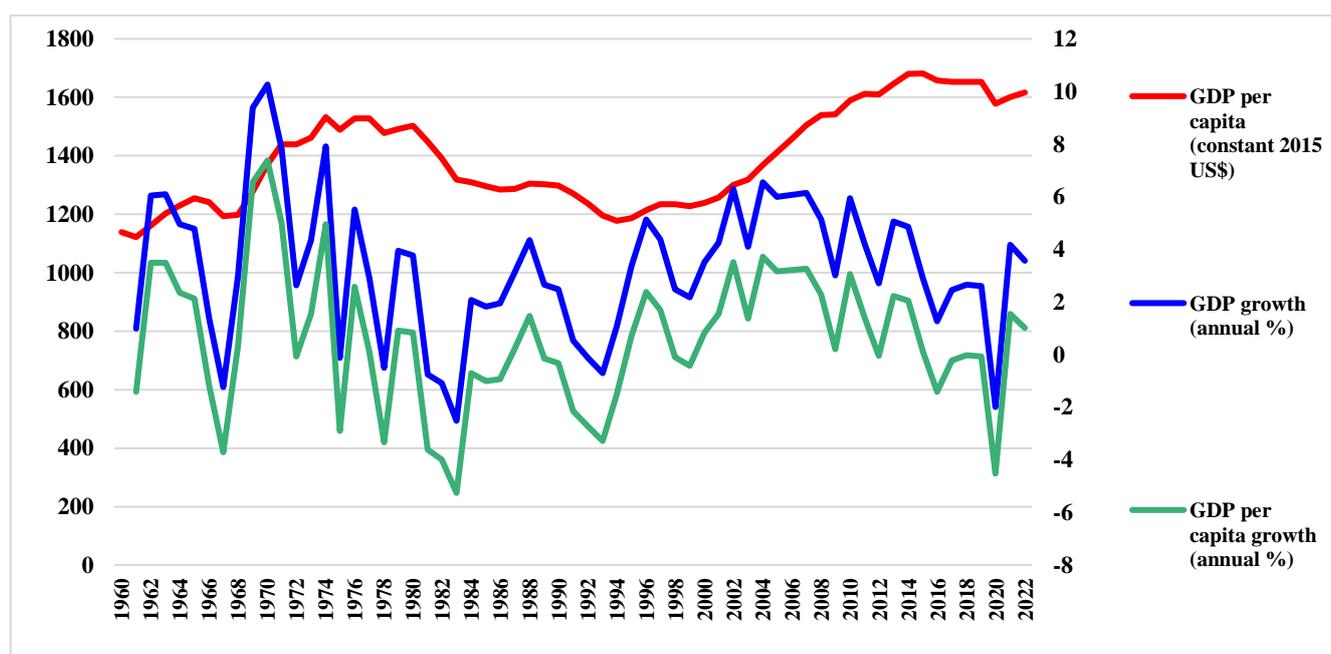
Figure 11: SSA and world, GDP per capita annual growth rates, 1960-2022



Source: World Bank World Development Indicators database, August 2023.

Indeed, the evidence that growth volatility is associated with types of economic performance ('bad' or 'good') over the long run may be difficult to prove. As argued by Easterly (2005), there is no empirical evidence that SSA's growth profile is that of a 'poverty trap' and trapping processes maintaining in stagnation: for Easterly, empirical evidence shows that SSA countries experience growth, even if this growth is slow.

Figure 12: SSA GDP per capita (constant 2015 US\$) (left axis), GDP growth and GDP per capita growth rates (right axis), 1960-2022



Source: World Bank World Development Indicators database, August 2023.

Growth rates are typically unstable over time, whereas country characteristics remain stable. Many studies have argued that external shocks (e.g., on terms of trade) explain most of the variability in growth (Easterly et al., 1993): technological change determines long-run growth, while country characteristics determine relative income levels.

3. GROWTH PATHS: KEY MAINSTREAM ‘BASICS’

3.1 MAINSTREAM MODALITIES OF CAUSATION

Until the 2000s (where the rise of ‘big data’-based studies has blurred the landscape, perhaps inducing a more ‘pluralist’ mainstream, Davis, 2006), mainstream neoclassical economics may be characterised by being based on, besides the concepts of utilitarianism and optimising rationality, that of equilibrium². Mainstream economics is therefore inherently confronted with the difficulty of conceptualising cumulative processes and path dependence.

² Even if equilibria may be ‘punctuated’, as in the evolutionary perspective explored by the neoinstitutionalist literature (e.g., Aoki, 2000).

Indeed, as analysed by Sindzingre and Tricou (2023), ‘old’ neoclassicism, which roughly emerged in the 1870s and declined from the 1970s onwards, typically assumes that in a perfectly competitive economy, equilibrium prices achieve coordination between price-taking agents, leading to an efficient competitive equilibrium. The theoretical framework is defined by two elements: general equilibrium analysis and perfect competition. In this vein, ‘new’ neoclassicism, which underscored strategic rationality, market failures and imperfect information, may not be a change in the paradigm, contrary to Stiglitz’ (2002) assertion, as it remains based on rationality optimisation and interindividual equilibrium.

Equally, a foundational methodology of mainstream economics is that of mathematical modelling – as recognised both by mainstream economists (Lazear, 1999) and ‘heterodox’ ones, and examined by a vast critical literature (e.g., Velupillai, 2005; Lawson, 2012). This pre-eminence of mathematisation is not only a mere matter of methodology, but is an epistemological engagement, as phenomena that cannot be addressed via statistical-econometric modelling are *in fine* placed outside the field of economics – and for mainstream economists, this pre-eminence must also be protected from loose and non-rigorous uses of models (Romer, 2015). Causation is therefore mainly addressed via models. It must be mentioned that heterodox research also uses modelling (e.g., post-Keynesian research, agent-based models, among others). Given this pre-eminence of methodology over explicit epistemological reflections, and as statistics and econometrics have constituted the dominant methodology, correlations, whose credibility is reduced to success in a variety of tests, are most often sufficient to be viewed as a causation.

In growth economics, besides econometric exercises using, for example, the canonical Solow model (which is a competitive general equilibrium model), endogenous growth assumptions or other types of growth regressions (e.g., using dummy variables), and focused on the signs and size of coefficients and residuals, the analysis of growth may also use the method of growth accounting. The latter explores the channels (factor accumulation vs. increased factor productivity) of variations in growth rates in the equation $Y=AK^\alpha (LH)^{1-\alpha}$ with A being the total factor productivity/TFP (which measures a combination of changes in efficiency in the use of those inputs and changes in technology; H being the measure of educational attainment, and α the capital share) (Bosworth and Collins, 2003). Here again, channels underlying variations in an equation cannot be considered as causation.

3.2 MAINTAINING THE FRAMEWORK VIA THE ABSORPTION OF CONCEPTS FROM OTHER SOCIAL SCIENCES

In view of facts that did not entirely align with theories of convergence, mainstream economics argued that it enriched its analysis of the causation of growth trajectories in adding non-economic variables to the usual ones in econometric models (e.g., investment, education, productivity, among others). Typical of non-strictly

economic variables, 'institutions' – e.g., economic, political, unwritten social norms - were thus added in the 1990s within equations modelling the determinants of growth, as supplementary variables that would refine explanations of the differences in growth levels or rates (Sindzingre, 2021a).

Yet it may be argued that these extensions do not depart from and actually strengthen the mainstream framework. This inclusion of a concept that is at the core of neighbouring social sciences has been more an absorption of it within the mainstream framework than a venture of economics into other social sciences (Sindzingre, 2017). Institutions were thus conceived more in terms of their functions than contents (the well-known 'reduction of transaction costs', North, 1990; 1991). The definitional traits of institutions that could be kept have only been those that could be transformed into quantifiable 'institutional variables' that econometric models and growth regressions can include: for example, numbers of ethnic groups for an institution such as 'social fractionalisation', numbers of parties for 'democracy', etc. Most economic studies ignored the non-quantitative literature in political science, sociology, anthropology, as well as the intrinsic heterogeneity of the concept of institutions.

Reflections on the differences in growth trajectories have led to the incorporation of politics and political economy. Yet in mainstream political economy, the concept of politics has been absorbed by and diluted in economic concepts, as the incorporation of politics has been theorised via rational choice and public choice approaches (Bates, 1981): indeed, the latter fit into the neoclassical framework as both assume individuals who are self-interested and driven by incentives and gains-maximisation (e.g., politicians). Macroeconomic effects are outcomes of these individual calculations. This incorporation of political phenomena has similarly been driven by the possibility of modelling them and implementing cross-country regressions exploring the impact on growth of these 'variables', for example the effects of political regimes (e.g., democracy) on growth (Przeworski et al., 2000). Conceptualisation of states has remained thin, as shown by simple qualifications of states in developing countries as 'failed', 'fragile' or 'collapsed'.

As with studies that include 'institutions', the results of these econometric exercises are often inconclusive and contradictory, because the causes at stake - institutions, political regimes, etc - are inherently multidimensional concepts, and hence causalities are dependent on the definition of the concept, on contexts, space and time - as was long demonstrated by social sciences.

The endogeneity of causalities that involve institutional, political economy and economic growth has certainly been examined by mainstream economics, for example via the concept of 'endogenous policies' (Kydland and Prescott, 1977; Acemoglu, 2002): governments face an inherent problem of credibility because there is no meta-level above government that has the coercive capacity to enforce government policies and promises, and this endogeneity of political and economic institutions leads to stagnation. It is here assumed that political attitudes are determined by economic incentives; the form of political and economic

institutions results from conflict between groups that have diverging interests ('elites', 'citizens'), and the causal framework keeps the concepts of optimising rationality, incentives, securing of property rights. Differences in growth trajectories are also explained by political economies based on extraction, where governments have neither incentives nor interests in fostering growth (Acemoglu and Robinson, 2006; 2012). Caught in the market efficiency assumption and Keynesian paradigms rejection, mainstream economics from the 1970s onwards also minimised the causality of the contribution of public policies to growth, notably industrial policies. Yet post-WWII 'founding fathers' of development economics considered state intervention to be necessary to correct coordination failures in interdependent investments in industry and move the economy out of a 'low-level equilibrium' trap: the state was viewed as the only entity able to reallocate factors (capital, labour, land) in poor countries and able to implement the 'big push' necessary for addressing coordination failures (Rosenstein-Rodan, 1943; Adelman, 2000). Regarding developing countries, these views were reinforced by international financial organisations (IMF, World Bank) ('government as a problem', 'Washington consensus', among others). Even if the abovementioned 'new neoclassicism' displayed in the 2000s more nuanced views of state intervention via concepts such as information asymmetries or market failures, and a reappropriation of the argument of underdevelopment as a consequence of coordination failures, even despite *de facto* huge public finance bailouts and 'whatever it takes' stances from the 2000s onwards, the conceptualisation of the state's contribution to growth has remained confined to limited roles and the mainstream causal framework has remained broadly stable.

4. EXPLAINING GROWTH TRAJECTORIES: THE RELEVANCE OF THE CONCEPT OF CUMULATIVE CAUSATION

Despite the extension by mainstream economics in the second half of the 20th century of the determinants of growth to variables from neighbouring social sciences, reflections on the nature of causalities involved thus remained under-addressed, in particular key mechanisms of causation represented by concepts such as cumulative causation, increasing returns and non-linearities.

Post-neoclassical models of growth have used the concept of increasing returns, particularly those stemming from the accumulation of knowledge such as in endogenous growth models, for example via increasing returns to specialisation (Romer, 1987; 1990) or Schumpeterian destruction (Aghion and Howitt, 1992): yet, as emphasised by Romer, these models refer to, e.g., a competitive equilibrium with endogenous technical change (1986), and remain within the framework of equilibrium (e.g. for specialisation, 'decentralised competitive equilibrium with externalities', Romer, 1987). Similarly, even 'unified growth' theories, despite emphasising cumulative processes and non-linearities, often develop dynamic general

equilibrium models (e.g., Galor et al., 2004). Equally, even if long-term history has become a significant topic in mainstream economics, it is more often addressed through the analyses and correlations of databases than through concepts such as, e.g., 'path dependence'.

The cumulative causation framework mobilises concepts such as feedback processes, lock-in devices, irreversibility, tipping points and threshold effects. Even if some authors, for example in complexity economics, use the concept of equilibria, these are multiple – e.g., 'high' and 'low' equilibria – and are more conceived as 'attractors' or 'basins of attraction'. In contrast, mainstream economics, in particular general equilibrium theories, tends to focus on questions such as the existence, efficiency or uniqueness of an equilibrium. Mechanisms of cumulative causation lead to convergence and divergence, as equilibria are processes that reinforce themselves. It is argued that cumulative causation is a more powerful tool for analysing divergence in incomes across countries or individuals, both at the macro and the micro level.

4.1 CUMULATIVE CAUSATION WITH HETEROGENEOUS CAUSALITIES

Beyond the trivial point that the theoretical framework of cumulative causation enables the view that causalities may aggregate, its key dimensions are: i) that it allows for considering that causes can be combined and that these causes are numerous, heterogeneous and involve concepts built by various social sciences: the effects of single causes taken separately may differ from those resulting from their combination; ii) that the framework of cumulative causation and 'traps' enables analyses where economics is fully integrated with the other social sciences - despite the neoclassical paradigm aiming to establish a separation and hierarchy (the 'superiority' of economics, Lazear, 1999).

Cumulative causation has been explored for a long time in 'heterodox' studies. Yet it must be mentioned that the concept of increasing returns has been also used in mainstream economics, notably by Krugman regarding international trade and geographical effects (Krugman, 1985; Krugman, 1991). Indeed, Krugman's (1991) analyses of regional divergence acknowledge the relevance of the concepts of circular causation elaborated by Gunnar Myrdal and that of positive feedback elaborated by Brian Arthur, and beyond, the theoretical frameworks of Brian Arthur and Paul David.

In a 'genealogical' perspective, a pioneer conceptualisation has been that of Allyn Young (1928) with the notion of increasing returns (due to externalities from capital accumulation). A key thinker of increasing returns has been Nicholas Kaldor (1967; 1981), who also emphasised the 'irrelevance of equilibrium economics' (Kaldor, 1972; 1985). His 'growth laws' argued that manufacturing is characterised by increasing returns to scale – while the role of initial conditions remains debated. The Kaldor-Verdoorn Law based on dynamic increasing returns to scale elaborates the possibility of endogenous technical change (Kaldor, 1957; Michl and Tavani, 2022). Kaldor made increasing returns and endogenous growth the basis of his theory of growth and his criticisms of conventional 'equilibrium economics'. Kaldor argued that industrialisation is a

cumulative process in which the development of industries producing consumer goods precedes the development of those producing capital goods, and where production for sale precedes production for export (Argyrous, 1996). Albert Hirschman also emphasised the importance of increasing returns. These earlier scholars were aware of the potentially destabilizing effects of increasing returns (Skott and Auerbach, 1995).

The concept of cumulative causation has its origins in the writings of Thorstein Veblen (1898) and Gunnar Myrdal (1944; 1957; 1968), who developed that of 'circular and cumulative causation', and these concepts have permeated the work of institutionalist authors (Toner, 1999 for a synthesis). For Kaldor (1970), circular and cumulative causation was in fact 'nothing else but the existence of increasing returns to scale (..) in processing activities'. It has been underscored that Young and Kaldor theorised cumulative causation more in terms of economies of scale, while Veblen and Myrdal theorised it more in terms of institutions (Fujita, 2004). Indeed, theoretical perspectives differed, Kaldor providing a taxonomy for investigating the industrial development of individual countries, and Veblen and Myrdal approaches developing the notion of cumulative causation in an evolutionary perspective (Argyrous, 1996; O'Hara, 2008) – though Veblen referred less to the concept of positive feedback than to sequences of causal links (Hodgson, 2009, who underlines that Young was an admirer of Veblen). Cumulative causation shows that an economy exhibits dual characteristics, i.e., the coexistence of advanced and backward sectors, as well as the importance of increasing returns (Skott, 1985).

As shown by Leon-Ledesma (2000), these cumulative causation models could be assimilated to 'endogenous' growth models: however, they differ from mainstream endogenous growth theories as cumulative growth models do not assume the existence of a general equilibrium and therefore the main driver of growth is demand. These theories thus contributed to the elaboration and consolidation of non-equilibrium economics - or at least more nuanced views of the debate on equilibrium vs. historical time (Setterfield, 1997a) -, as well as evolutionary economics (Berger, 2009). These lines of research inspired by T. Veblen, G. Myrdal, A. Young, or N. Kaldor have constituted major alternatives to mainstream views.

The framework of increasing returns and cumulative causation remains central in heterodox studies, including post-Keynesian and institutionalist fields. Among others, for example, Setterfield (2001) has thus revealed that increasing specialisation, concomitant increases in the complexity of the social organisation of production, and the proliferation of interrelatedness between components of the production process constitute factors of growth. Equally, regarding developing economies, Schwaradt (2013) has shown that development may be slower (or not) depending on the institutional environment and the latter's combination with technology, and underscored that reversals of prior advances are always possible.

The explanatory power of the framework of cumulative causation appears even more clearly when associated with the concept of 'lock-in'. As early as 1943, Paul Rosenstein-Rodan showed the relevance of 'lock-in' phenomena as key causes of underdevelopment and the role of spillovers effects, the importance of coordination in the dynamics of growth, and the possibility of 'underdevelopment traps'. The concepts of lock-in processes (e.g., by historical small events), path dependence, and self-reinforcing mechanisms have grounded the field of complexity economics (Arthur, 1989; 1994a; 2021): growth trajectories differ because certain equilibria lock-in economies in processes that are detrimental for growth, and self-reinforcement dynamics are possible that may lock individuals (or countries) into inefficient behaviour or equilibria. An implication is that even with suitable initial conditions the same mechanisms can lead to either optimal or inefficient equilibria.

David (1985) also conceptualised the mechanisms of lock-in (for example by technological choices, e.g., the famous example of the QWERTY keyboard) and positive feedbacks, and in particular that of path dependence. He showed that changes, typically small ones, may occur endogenously and that locking-in equilibria may be optimal or detrimental (David, 2000). He insisted that path dependence does not mean determinism – determinism having been a critique made to the cumulative causation framework, once initial conditions are given and in the absence of shocks (Setterfield, 1997b). Such dynamic processes are also cognitive, and they may imply the locking-in in mental models and beliefs (Arthur, 1994b; Sindzingre, 2007b).

In addition, cumulative causation processes typically generate trapping processes. Matsuyama (2009) thus defined a poverty trap as a 'self-perpetuating condition whereby an economy, caught in a vicious circle, suffers from persistent underdevelopment'. Developing countries are characterised by the lack of demand and the lack of support industries, which are mutually interrelated. This circular causation creates underdevelopment traps. As shown by Matsuyama (2009), a mechanism that is common to underdevelopment traps is the existence of external economies or complementarities, which generate the circular causation: e.g., learning-by-doing externalities, search externalities; threshold externalities characterising human capital; the vicious circles of limited market size and limited division of labour; limited financial development; the vicious circle of low wealth-low investment; demographic traps; social norms. In developing countries, the latter may often be those organising high inequality (e.g., gender, statuses) and group memberships (Bowles, 2006) (castes being an example).

The explanatory power of the approach of cumulative causalities involving multiple causes - economic, spatial, cognitive -, has been confirmed at the microeconomic level by the theories of 'social interactions', notably those of 'neighbourhood traps' (Durlauf, 2004) (e.g., urban 'ghettos' in the US) and 'membership traps' (Durlauf and Young, 2001). These constitute 'social poverty traps' (in contrast with 'national poverty traps' involving countries or regions, Durlauf and Shaoshadze, 2014): here, social disadvantage and poverty

combine with education, limited tax collection, insufficient public policies (poor infrastructure) inducing the importance of groups memberships, and beliefs of individuals regarding their future, which result in a perpetuating and transgenerational poverty. Indeed, such approaches endogenise beliefs: beliefs may lead to different outcomes in terms of income and perpetuate poverty.

Yet it must be underlined that circularity does not imply vicious circles. Complementarity is here a crucial concept: if complementarity exists, 'nothing succeeds like success, and poverty becomes its own cause' (Matsuyama, 1995). Similarly, Azariadis and Stachurski (2005) argue that there is always the potential, even small, to escape any basin of attraction.

The key point is that all these processes constitute deviations from the competitive neoclassical benchmark and explain growth and income differences more accurately (Azariadis and Stachurski, 2005).

Importantly, the conceptual framework here involves combinations of many causalities. As highlighted by Hall and Whybrow (2008; 2009) circular and cumulative causation focuses on 'continuity and continuousness' and emphasises the interactions between all dimensions of human beings. Beyond economic concepts, it includes social norms, institutions, public policies, politics, and it is a framework that integrates all social sciences.

4.2 CUMULATIVE AND MULTIPLE CAUSATIONS: CONTRASTING REGIONS, E.G., EAST ASIA AND SSA

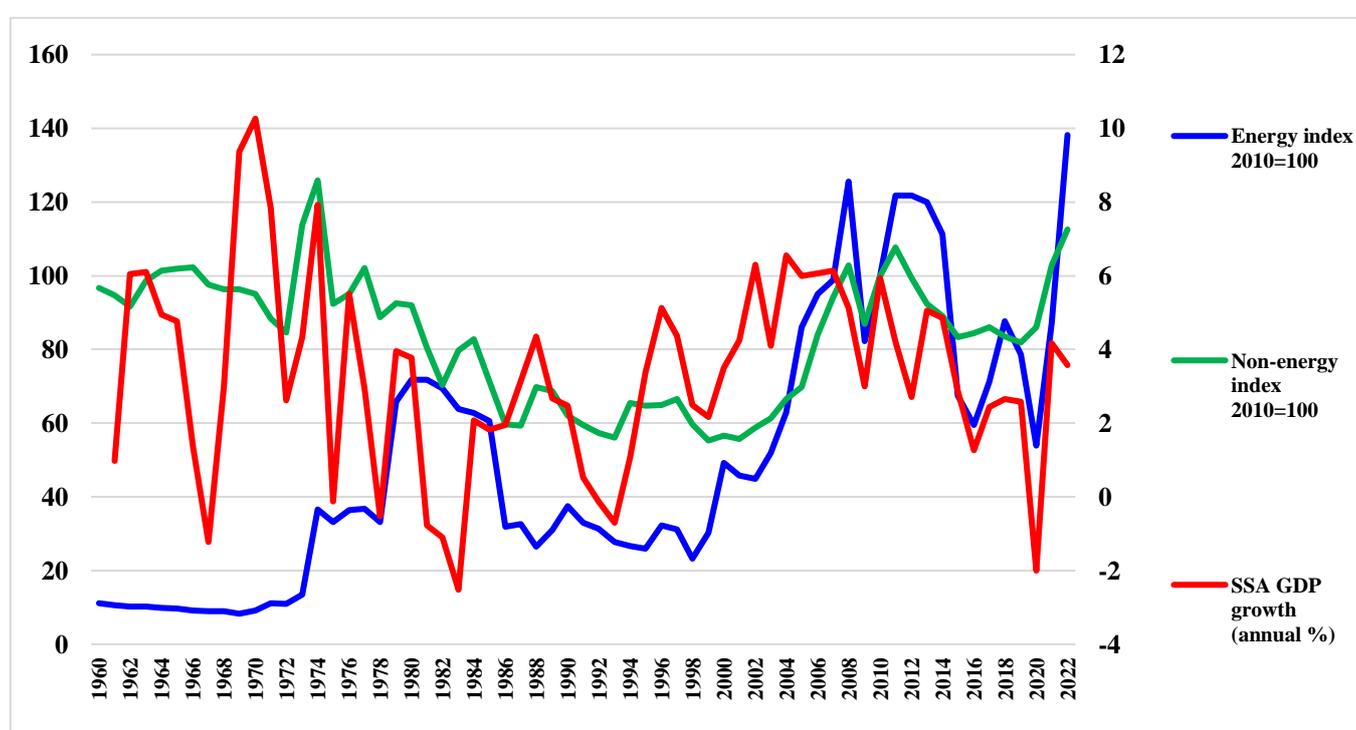
Cumulative causation processes involve heterogeneous causalities. Moreover, the effects of these causalities vary and evolve with time, and they can be either short-, medium- or long-term determinants. Equally, the 'forms' of cumulative causation processes, being distinct from the specific content of causes, may differ and generate distinct outcomes: For example, for countries, growth rates fluctuate more than income levels. Phenomena that remain stable in time, like institutions and social norms, are therefore less likely to participate in the causation of growth rates than in the causation of long-term income levels.

Regarding Sub-Saharan African countries, due to their common characteristic of heavy dependence on primary commodities for exports, growth rates have been driven by the volatility of commodity prices, which is induced, among other causes, by the fluctuations of external demand (e.g., from industrial countries, or China).

These fluctuations may not be causalities of long-term growth. Indeed, among others, a long-term determinant of growth is structural change, which is based on trade diversification and productivity growth with reallocation effects due to movements of labour from low to high productivity sectors (McMillan and Rodrik, 2011). Importantly, structural change is a holistic process, which involves the entire society: as emphasised by Matsuyama (2008), it is a 'complex, intertwined phenomenon, not only because economic

growth brings about complementary changes in various aspects of the economy (..), but also because these changes in turn affect the growth process’.

Figure 13: SSA growth rate (right scale) and commodity prices (annual price index, real 2010 US dollars, left scale), 1960-2022



Sources: World Bank Commodity Price Data, <http://www.worldbank.org/en/research/commodity-markets>; World Bank World Development Indicators database, October 2023.

This dependence on commodities for their exports is a major vulnerability of SSA countries’ long-term growth because commodity prices are inherently volatile, which induces the volatility of growth rates, which in turn has detrimental effects because growth volatility negatively impacts income levels. Indeed, the volatility of determinants of growth *per se* appears to have negative effects on long-term growth (Ramey and Ramey, 1995; Imbs, 2007).

In contrast, the East Asian countries (‘developmental states’) that experienced ‘catch-up’ had few natural resources, which may have been an incentive to labour-intensive industrialisation. Additionally, these

countries started their growth with high levels of human capital (Noland, 2012 for Korea). For their part, SSA countries are characterised by low levels of education and health³.

Equally, in East Asia, both market-based (Japan, Korea) and partially market-based economies (China) had in common to be 'strong' states. Notably, these states had the capacity to implement policies. Public policies are indeed viewed as key factors of growth for neoclassical or endogenous growth models, e.g., building physical or human capital, or fostering innovation. East Asian states focused on industrial policies conditional to growth, also including education and the competence of bureaucracy. Public policies were more directive policies than direct investment in the economy (Huff et al., 2001). Public policies preserved market mechanisms (Wade, 1990; Aoki et al., 1996; Sindzingre, 2007a). In China, industrialisation has been and still is the cornerstone of growth since the opening policy and the inception of its spectacular growth from the 1980s onwards (Zhao and Ruet, 2021; Sindzingre, 2021b). Combined with many other causalities, the capacity to devise growth-oriented, credible, and legitimate public policies has constituted an important causality underlying the growth of these states.

For their part, following the first stabilisation and adjustment programmes of the early 1980s, public policies in most SSA economies were shaped by external organisations, notably the international financial institutions (IMF, World Bank). In line with mainstream views on markets and competition efficiency, these institutions conditioned their financing to the reduction of state intervention – with a particular aversion to industrial policies, which were seen as unacceptable 'distortions'.

Furthermore, many East Asian states demonstrated a capacity to channel rent-seeking and underscored the key causality of politics in the growth process: growth was instrumental for rulers in building their political legitimacy (as in China). In contrast, many SSA states remain characterised by clientelist political regimes (Sindzingre, 2012a).

In sum, in Asian developmental states, cumulative causation involved public (industrial) policies combined with 'strong' states, capable bureaucracies, high levels of human capital, long-term political time frames, with countries' growth being instrumental to rulers' interests. In contrast, in most SSA countries, public policies have been devised by rulers driven by private interests and by external international financial institutions. This has combined with bureaucracies plagued by clientelism and a weak consolidation of political institutions. This has shortened the time frames of rulers - long-term growth not being these rulers' interest –, which in turn has reinforced for citizens the lack of credibility of public policies, and a political economy dominated by private interests and fragmented social groups viewing the state as a resource to 'capture'.

³ For SSA, a literacy rate of 67% of all adults above 15 in 2020, from 49% in 1985 (source: World Bank World Development Indicators, July 2023).

In SSA, the above nexus has combined with specific endowments, i.e., primary commodities, exposing to external shocks due to the volatility of commodity prices, resulting in the need for IMF conditional lending, but conditional on inappropriate policies, leading to decades of a 'basin of attraction' ('low equilibrium') of conditional lending-cum-stagnation. Additionally, the requirements by donors from the 1990s onwards for the simultaneous implementation of economic and political reforms ('democratisation') exacerbated fiscal problems within a context of patronage politics.

In SSA, this nexus also combined with geographical characteristics, e.g., the existence of landlocked countries, low labour-land ratios that have hindered tax collection, the provision of public goods (hence limiting states' capacity, notably to conduct efficient policies), the dissemination of innovation and the increasing returns to scale of agglomeration. These characteristics contrasted with East Asia's long history of demographic density.

The abovementioned stylised facts show that SSA growth trajectories exemplify vicious circles and exhibit the theoretical features of detrimental cumulative causation, threshold effects and tipping points, and entrapment into low equilibria (Sindzingre, 2012b). These causations are characterised by circularity and endogeneity: e.g., differences in institutions lead to different policy choices; or geography influences institutions while being influenced by them, institutions not being exogenous. Some studies have asserted that there are hierarchies in causations, and in particular that institutions would be primary causes of growth, e.g., surpassing the impact of geography or trade integration (Rodrik et al., 2004). Yet, as shown by Engerman and Sokoloff (2003), growth cannot be entirely explained by institutions.

In fine, the contrasting growth paths between SSA and other parts of the world, such as East Asia, which experienced sustained growth and, in some cases, convergence, demonstrate the relevance of the concept of cumulative causation, as it allows for the involvement of a multiplicity of combinations of causes.

Yet it is important to emphasise that the effects of these combinations are difficult to predict *ex ante*. Equally, in cumulative causation processes, by definition, a causality does not act in isolation and outcomes always result from combinations of causes. Also, cumulative causation processes 'are not fate'. As highlighted by Brian Arthur or Paul David, large changes may arise from small events, and cumulative causation does not mean determinism.

5. CONCLUSION

Departing from the empirical observation of the divergence in incomes and growth paths across countries, particularly visible in the Sub-Saharan African region, this article has underscored the limitations of the theoretical explanations of growth emphasised by mainstream economics regarding the understanding of

the mechanisms behind these divergences – including when mainstream economics attempted to improve models with non-strictly economic variables.

The article has shown that the conceptual framework grounded in the concept of cumulative causation – along with the related concepts of non-linearities and trapping dynamics – offers a greater explanatory power regarding the processes underlying differences in growth and income across countries. This framework, by definition, allows causation to be cumulative and heterogeneous (involving economic structures, beliefs, norms, public policies): here the effects of causes taken separately may differ from those resulting from their combination. This framework is thus a core tool for reflections on complexity. Stylised facts from the growth trajectories of East Asia and Sub-Saharan Africa have been used as empirical illustrations of these combinations of causes.

Moreover, this conceptual framework enables the conceptualisation of an important element of ‘heterodox’ economics, i.e., that the causalities of economic phenomena result from combination of causes that may pertain to a society as a whole and therefore may involve all other social sciences. After decades of mainstream economics constantly attempting to epistemologically separate economics from other social sciences, this framework thus allows for a full reintegration of economics into them.

BIBLIOGRAPHY

- Abramowitz, Moses (1986) Catching Up, Forging Ahead, and Falling Behind, *Journal of Economic History*, vol. 46, n°2, June, pp. 385-406.
- Acemoglu, Daron (2002), Why Not a Political Coase Theorem? Social Conflict, Commitment and Politics, Cambridge MA, NBER working paper 9377.
- Acemoglu, Daron and James Robinson (2006), *Economic Origins of Dictatorship and Democracy*, Cambridge, Cambridge University Press.
- Acemoglu, Daron and James Robinson (2012), *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*, New York, Crown Business.
- Adelman, Irma (2000), The Role of Government in Economic Development, in Finn Tarp ed., *Foreign Aid and Development: Lessons Learnt and Directions for the Future*, London, Routledge.
- Aghion, Philippe and Peter Howitt (1992), A Model of Growth Through Creative Destruction, *Econometrica*, vol. 60, n°2, March, pp. 323-351.
- Aoki, Masahiko (2000), Institutional Evolution as Punctuated Equilibria, in Claude Ménard ed., *Institutions, Contracts and Organizations*, Cheltenham, Edward Elgar.
- Aoki, Masahiko, Hyung-Ki Kim and Masahiro Okuno-Fujiwara eds. (1996), *The Role of Government in East Asian Economic Development: Comparative Institutional Analysis*, Oxford, Clarendon Press.
- Arthur, W. Brian (1989), Competing Technologies, Increasing Returns and Lock-In by Historical Events, *Economic Journal*, vol. 99, n°394, March, pp. 116-131, reprinted in Arthur (1994a).
- Arthur, W. Brian (1994a), *Increasing Returns and Path Dependence in the Economy*, Ann Arbor, University of Michigan Press.
- Arthur, W. Brian (1994b), Inductive Reasoning and Bounded Rationality, *American Economic Review*, vol. 84, n°2, May, pp. 406-411.
- Arthur, W. Brian (2015), *Complexity and the Economy*, Oxford, Oxford University Press.
- Arthur, W. Brian (2021), Foundations of Complexity Economics, *Nature Reviews-Physics*, vol. 3, February, pp. 136-145.
- Argyrous, George (1996), Cumulative Causation and Industrial Evolution: Kaldor's Four Stages of Industrialization as an Evolutionary Model, *Journal of Economic Issues*, vol. 30, n°1, March, pp. 97-119.
- Azariadis, Costas and John Stachurski (2005), Poverty Traps, in Philippe Aghion and Steven Durlauf eds., *Handbook of Economic Growth*, Amsterdam, North-Holland.

Barrett, Christopher B. and Brent M. Swallow (2006), Fractal Poverty Traps, *World Development*, vol. 34, n°1, January, pp. 1-15.

Bates, Robert H. (1981), *Markets and States in Tropical Africa*, Berkeley, University of California Press.

Berger, Sebastian ed. (2009), *The Foundations of Non-Equilibrium Economics: The Principle of Circular Cumulative Causation*, New York, Routledge.

Blattman, Christopher, Jason Hwang and Jeffrey G. Williamson (2007), Winners and Losers in the Commodity Lottery: The Impact of Terms of Trade Growth and Volatility in the Periphery 1870–1939, *Journal of Development Economics*, vol. 82, pp. 156–179.

Bosworth, Barry P. and Susan M. Collins (2003), The Empirics of Growth: An Update, *Brookings Papers on Economic Activity*, vol. 2, pp. 113-206.

Bowles, Samuel (2006), Institutional Poverty Traps, in Samuel Bowles, Steven N. Durlauf and Karla Hoff eds., *Poverty Traps*, Princeton, Princeton University Press.

Clark, Gregory (2007), *A Farewell to Alms: A Brief Economic History of the World*, Princeton, Princeton University Press.

Clark, Gregory and Robert Feenstra (2001), *Technology in the Great Divergence*, Cambridge MA, NBER working paper 8596.

Court, Victor (2020), A Reassessment of the Great Divergence Debate: Towards A Reconciliation of Apparently Distinct Determinants, *European Review of Economic History*, vol. 24, n°4, November, pp. 633–674.

David, Paul A. (1985), Clio and the Economics of QWERTY, *American Economic Review*, vol. 75, n°2, pp. 332–337.

David, Paul A. (2000), Path Dependence, its Critics and the Quest for ‘Historical Economics’, mimeo, Oxford, All Souls College, in P. Garrouste and S. Ioannides eds., *Evolution and Path Dependence in Economic Ideas*, Cheltenham, Edward Elgar.

Davis, John B. (2006), The Turn in Economics: Neoclassical Dominance to Mainstream Pluralism?, *Journal of Institutional Economics*, vol. 2, n°1, pp. 1-20.

Diamond, Jared (1997), *Guns, Germs, and Steel: The Fates of Human Societies*, New York, W. W. Norton.

Durlauf, Steven N. (2004), Neighborhood Effects, in J.V Henderson and J.E Thisse eds., *Handbook of Regional and Urban Economics*, vol. 4, Amsterdam, Elsevier.

Durlauf, Steven N. and Paul A. Johnson (1995), Multiple Regimes and Cross-Country Growth Behaviour, *Journal of Applied Econometrics*, vol. 10, n°4, October-December, pp. 365-384.

Durlauf, Steven N. and Henry Peyton Young (2001), The New Social Economics, in Steven N. Durlauf and Henry Peyton Young eds., *Social Dynamics*, Cambridge MA, MIT Press.

Durlauf, Steven N. and Irina Shaoshadze (2014), Poverty Traps, in Mehmet Odekon and J. Geoffrey Golson eds. *Encyclopedia of World Poverty*, 2nd edition, Sage.

Easterly, William (2005), Reliving the 50s: the Big Push, Poverty Traps and Takeoffs in Economic Development, Washington D. C., IFPRI-Cornell Conference on Threshold Effects and Non-Linearities in Growth and Development.

Easterly, William, Michael Kremer, Lant Pritchett and Lawrence Summers (1993), Good Policy or Good Luck, *Journal of Monetary Economics*, vol. 32, pp. 459-483.

Elsner, Wolfram, Torsten Heinrich and Henning Schwardt (2014), *The Microeconomics of Complex Economies: Evolutionary, Institutional, Neoclassical, and Complexity Perspectives*, Oxford, Academic Press.

Engerman, Stanley L. and Kenneth L. Sokoloff (2003), Institutional and Non-Institutional Explanations of Economic Differences, Cambridge MA, NBER working paper 9989.

Fujita, Nanako (2004), Gunnar Myrdal's Theory of Cumulative Causation Revisited, Nagoya, Nagoya University, Graduate School of Economics, Economic Research Center discussion paper 147.

Galor, Oded (2005), The Demographic Transition and the Emergence of Sustained Economic Growth, *Journal of the European Economic Association*, vol. 3, n°2/3, April-May, pp. 494-504.

Galor, Oded (2011), *Unified Growth Theory*, Princeton, Princeton University Press.

Galor, Oded and David N. Weil (2000), Population, Technology and Growth: From Malthusian Stagnation to the Demographic Transition and Beyond, *American Economic Review*, vol. 90, n°4, September, pp. 806-828.

Galor, Oded, Omer Moav and Dietrich Vollrath (2004), Land Inequality and the Origin of Divergence and Overtaking in the Growth Process: Theory and Evidence, Providence, Brown University, Brown Economics working paper 2003-04.

Hall, John and Oliver Whybrow (2008), Continuity and Continuousness: The Chain of Ideas Linking Peirce's Synechism to Veblen's Cumulative Causation, *Journal of Economic Issues*, vol. 42, n°2, June, pp. 349-355.

Hall, John and Oliver Whybrow (2009), Peirce, Veblen, and the Introduction of Cumulative Causation into Economic Science, in Sebastian Berger ed., *The Foundations of Non-Equilibrium Economics: The Principle of Circular Cumulative Causation*, New York, Routledge.

Hausmann, Ricardo, Lant Pritchett and Dani Rodrik (2005), Growth Accelerations, *Journal of Economic Growth*, vol. 10, n°4, pp. 303-329.

Hausmann, Ricardo, Francisco Rodríguez and Rodrigo Wagner (2006), Growth Collapses, Cambridge MA, Centre for International Development, CID working paper 136.

Hodgson, Geoffrey (2009), Foreword, in Sebastian Berger ed., *The Foundations of Non-Equilibrium Economics: The Principle of Circular Cumulative Causation*, New York, Routledge.

Huff, W. Gregg, Gerda Dewit and Christine Oughton (2001), Building the Developmental State: Achieving Economic Growth Through Cooperative Solutions: A Comment on Bringing Politics Back In, *Journal of Development Studies*, vol. 38, n°1, October, pp. 147-151.

Imbs, Jean (2007), Growth and Volatility, *Journal of Monetary Economics*, vol. 54, n°7, pp. 1848-1862.

Kaldor, Nicholas (1957), A Model of Economic Growth, *Economic Journal*, vol. 68, n°268, pp. 591-624.

Kaldor, Nicholas (1967), *Strategic Factors in Economic Development*, Ithaca, Cornell University.

Kaldor, Nicholas (1970), The Case for Regional Policies, *Scottish Journal of Political Economy*, vol. 17, 337-348.

Kaldor, Nicholas (1972), The Irrelevance of Equilibrium Economics, *Economic Journal*, vol. 82, n°328, December, pp. 1237-1255.

Kaldor, Nicholas (1981), The Role of Increasing Returns, Technical Progress and Cumulative Causation in the Theory of International Trade, *Economie Appliquée*, vol. 24, n°4, pp. 593-617.

Kaldor, Nicholas (1985), *Economics Without Equilibrium*, Armonk, M. E. Sharpe (three lectures in memory of Arthur M. Okun).

Krugman, Paul R. (1985), *Increasing Returns and the Theory of International Trade*, Cambridge MA, NBER working paper 1752.

Krugman, Paul R. (1991), Increasing Returns and Economic Geography, *Journal of Political Economy*, vol. 99, n°3, pp. 483-499.

Kydland, Finn and Edward Prescott (1977), Rules Rather Than Discretion: The Inconsistency of Optimal Plans, *Journal of Political Economy*, vol. 85, n°3, June, pp. 473-491.

Lawson, Tony (2012), Mathematical Modelling and Ideology in the Economics Academy: Competing Explanations of the Failings of the Modern Discipline?, *Economic Thought*, vol. 1, pp. 3-22.

Lazear, Edward (1999), *Economic Imperialism*, Cambridge MA, NBER working paper 7300.

- León-Ledesma, Miguel A. (2000), Cumulative Growth and the Catching-up Debate from a Disequilibrium Standpoint, Canterbury, University of Kent, Department of Economics, discussion paper 0001.
- Maddison, Angus (2001), *The World Economy: A Millennial Perspective*, Paris, OECD.
- Maddison, Angus (2003), *The World Economy: Historical Statistics*, Paris, OECD.
- Matsuyama, Kiminori (1995), Complementarities and Cumulative Processes in Models of Monopolistic Competition, *Journal of Economic Literature*, vol. 33, n°2, June, pp. 701–729.
- Matsuyama, Kinimori (2008), *Structural Change*, Steven N. Durlauf and Lawrence E. Blume eds., New Palgrave Dictionary of Economics, 2nd edition.
- Matsuyama, Kinimori (2009), *Poverty Traps*, New Palgrave Dictionary of Economics, online.
- McMillan, Margaret and Dani Rodrik (2011), *Globalization, Structural Change and Productivity Growth*, Cambridge MA, NBER working paper 17143.
- Michl, Thomas R. and Daniele Tavani (2022), Path Dependence and Stagnation in a Classical Growth Model, *Cambridge Journal of Economics*, vol. 46, pp. 195–218.
- Milanovic, Branko (2016), *Global Inequality: A New Approach for the Age of Globalization*, Cambridge MA, Harvard University Press.
- Myrdal, Gunnar (1944), *An American Dilemma*, New York, Harper and Row.
- Myrdal, Gunnar (1957), *Economic Theory and Underdeveloped Regions*, London, G. Duckworth.
- Myrdal, Gunnar (1968), *Asian Drama*, New York, Penguin.
- Noland, Marcus (2012), Korea's Growth Performance: Past and Future, *Asian Economic Policy Review*, vol. 7, pp. 20–42.
- North, Douglass C. (1990), *Institutions, Institutional Change and Economic Performance*, New York, Cambridge University Press.
- North, Douglass C. (1991), Institutions, *Journal of Economic Perspectives*, vol. 5, n°1, Winter, pp. 97-112.
- O'Hara, Phillip Anthony (2008), Principle of Circular and Cumulative Causation: Fusing Myrdalian and Kaldorian Growth and Development Dynamics, *Journal of Economic Issues*, vol. XLII, n°2, June, pp. 375-387.
- Pomeranz, Kenneth (2000), *The Great Divergence: China, Europe, and the Making of the Modern World Economy*, Princeton, Princeton University Press.

Przeworski, Adam, Michael E. Alvarez, José Antonio Cheibub and Fernando Limongi (2000), *Democracy and Development: Political Institutions and Well-Being in the World, 1950-1990*, Cambridge, Cambridge University Press.

Ramey, Garey and Valerie A. Ramey (1995), *Cross Country Evidence on The Link Between Volatility and Growth*, *American Economic Review*, vol. 85, n°5, December, pp. 1138–1151.

Rodrik, Dani (2011), *The Future of Economic Convergence*, Cambridge MA, NBER working paper 17400.

Rodrik, Dani Rodrik (2016), *Premature Deindustrialization*, *Journal of Economic Growth*, vol. 21, n°1, March, pp. 1-33.

Rodrik, Dani, Arvind Subramanian and Francesco Trebbi (2004), *Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development*, *Journal of Economic Growth*, vol. 9, n°2, June, pp. 131-165.

Romer, Paul M. (1986), *Increasing Returns and Long-Run Growth*, *Journal of Political Economy*, vol. 94, n°5, October, pp. 1002-1037.

Romer, Paul M. (1987), *Growth Based on Increasing Returns to Specialization*, *American Economic Review*, vol. 77, n°2, May, pp. 56–62.

Romer, Paul M. (1990), *Endogenous Technological Change*, *Journal of Political Economy*, vol. 98, n°5, October, pp. 571–102.

Romer, Paul M. (2015), *Mathiness in the Theory of Economic Growth*, *American Economic Review*, vol. 105, n°5, May, pp. 89-93.

Rosenstein-Rodan, Paul N. (1943), *Problems of Industrialization of Eastern and South-Eastern Europe*, *Economic Journal*, vol. 53, n°210-211, June-September, pp. 202-211.

Schwardt, Henning (2013), *Institutions, Technology and Circular and Cumulative Causation in Economics*, London, Palgrave Macmillan.

Setterfield, Mark (1997a), *Should Economists Dispense with the Notion of Equilibrium?*, *Journal of Post Keynesian Economics*, vol. 20, n°1, Autumn, pp. 47-76.

Setterfield, Mark (1997b), *History versus Equilibrium and the Theory of Economic Growth*, *Cambridge Journal of Economics*, vol. 21, n°3, May, pp. 365–378.

Setterfield, Mark (2001), *Cumulative Causation, Interrelatedness and the Theory of Economic Growth: A Reply to Argyrous and Toner*, *Cambridge Journal of Economics*, vol. 25, n°1, January, pp. 107-112.

Sindzingre, Alice Nicole (2007a), Financing the Developmental State: Tax and Revenue Issues, *Development Policy Review*, vol. 25, n°5, September, pp. 615-632.

Sindzingre, Alice Nicole (2007b), Poverty Traps: A Perspective from Development Economics, Paris, University Paris-West, *EconomiX* working paper 26.

Sindzingre, Alice Nicole (2012a), The Reinterpretation of Neopatrimonialism by Development Economics, in Daniel C. Bach and Mamoudou Gazibo eds., *The Neopatrimonial State in Africa and Beyond*, London, Routledge.

Sindzingre, Alice Nicole (2012b), The Impact of the 2008–2009 Crisis on Commodity-Dependent Low-Income African Countries: Confirming the Relevance of the Concept of Poverty Trap?, *Journal of International Development*, vol. 24, n°8, November, pp. 989–1007.

Sindzingre, Alice Nicole (2017), Can Anything Be a Variable? Conceptual Weaknesses in the Integration by Mainstream Economics of Other Social Sciences, Rennes, French Association of Political Economy (AFEP) 7th Congress, 5-7 July.

Sindzingre, Alice Nicole (2021a), Concept and Causation: Issues in the Modelling of Institutions, *Forum for Social Economics* (Symposium 'The Complexity of Institutions: Theory and Computational Models'), vol. 50, n°2, pp. 194-213.

Sindzingre, Alice Nicole (2021b), Economic Relationships Between Sub-Saharan Africa and China: An Alternative Theoretical and Policy Paradigm?, African Studies Association (ASA) 64th Annual Meeting, Virtual, 16-20 November.

Sindzingre, Alice Nicole and Fabrice Tricou (2023), Capturing Three Phases of Neoclassical Economics Through an Extended Concept of Consequentialism, Paris, French Association of Political Economy (AFEP) 12th Congress, 4-7 July.

Skott, Peter (1985), *Vicious Circles and Cumulative Causation*, London, Thames Polytechnic, Thames papers in Political Economy.

Skott, Peter and Paul Auerbach (1995), Cumulative Causation and the "New" Theories of Economic Growth, *Journal of Post Keynesian Economics*, vol. 17, n°3, Spring, pp. 381-402.

Stiglitz, Joseph E. (2002), Information and the Change in the Paradigm in Economics, *American Economic Review*, vol. 92, n°3, June, pp. 460-501.

Toner, Phillip (1999), *Main Currents in Cumulative Causation: The Dynamics of Growth and Development*, London, Macmillan and New York, St. Martin's Press.

UNCTAD (2023), State of Commodity Dependence 2023, Geneva, United Nations Conference on Trade and Development.

Veblen, Thorstein (1898), Why is Economics Not an Evolutionary Science?, Quarterly Journal of Economics, vol. 12, pp. 373–397.

Velupillai, K. Vela (2005), The Unreasonable Ineffectiveness of Mathematics in Economics, Cambridge Journal of Economics, vol. 29, n°6, November, pp. 849-872.

Wade, Robert (1990), Governing the Market: Economic Theory and the Role of Government in East Asian Industrialisation, Princeton, Princeton University Press.

Young, Allyn A. (1928), Increasing Returns and Economic Progress, Economic Journal, vol. 38, n°152, December, pp. 527-542.

Zhao, Wei and Joël Ruet (2021), Managing the “Post Miracle” Economy in China: Crisis of Growth Model and Policy Responses, Post-Communist Economies, vol. 33, n°7, pp. 820-841.

Annex

Source: <http://kai.sub.blue/images/True-Size-of-Africa-kk-v3.pdf>

The True Size of Africa

A small contribution in the fight against rampant immappancy, by Kai Krause

In addition to the well known social issues of illiteracy and innumeracy, there also should be such a concept as "immappancy", meaning insufficient geographical knowledge.

A survey with random American schoolkids let them guess the population and land area of their country. Not entirely unexpected, but still rather unsettling, the majority chose "1-2 billion" and "largest in the world", respectively. Even with Asian and European college students, geographical estimates were often off by factors of 2-3. This is partly due to the highly distorted nature of the predominantly used mapping projections (such as Mercator).

A particularly extreme example is the worldwide misjudgement of the true size of Africa. This single image tries to embody the massive scale, which is larger than the USA, China, India, Japan and all of Europe - combined!

COUNTRY	AREA x 1000 km ²
USA	9.629
China	9.573
India	3.287
Mexico	1.964
Peru	1.285
France	653
Spain	506
Papua New Guinea	462
Sweden	441
Japan	378
Germany	357
Norway	324
Italy	301
New Zealand	270
United Kingdom	243
Nepal	147
Bangladesh	144
Greece	132
TOTAL	30.102
AFRICA	30.221
Just for Reference: The Surface of the MOON	37.530

Please note:

The graphical layout of this map is meant purely as a visualization to illustrate the fact: Africa is much larger than almost everyone assumed. Even totally blurred outlines could have been used to make that point, however the table at left is very accurate, citing:

http://en.wikipedia.org/w/index.php?title=List_of_countries_by_area

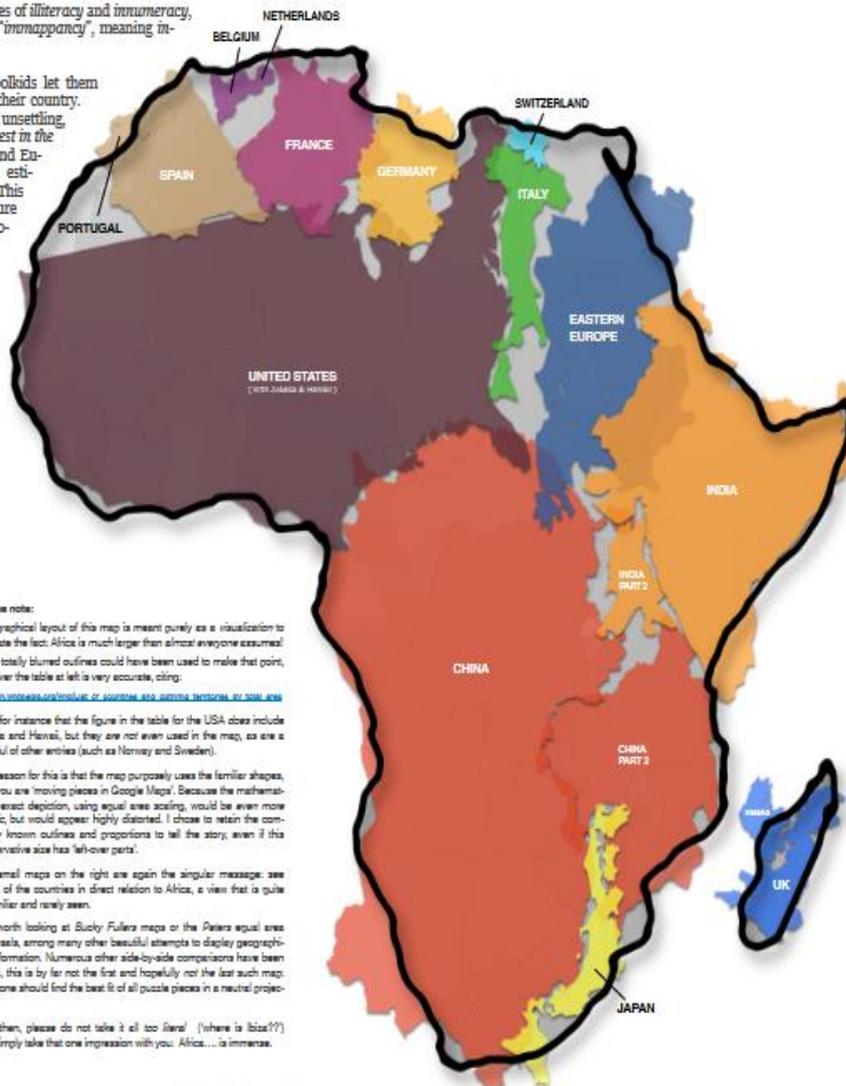
Note for instance that the figure in the table for the USA also include Alaska and Hawaii, but they are not even used in the map, as are a handful of other entries (such as Norway and Sweden).

The reason for this is that the map purposely uses the familiar shapes, as if you are 'moving pieces in Google Maps'. Because the mathematically exact depiction, using equal area scaling, would be even more drastic, but would appear highly distorted. I chose to retain the commonly known outlines and proportions to tell the story, even if this conservative size has 'left-over parts'.

The small maps on the right are again the singular message: see some of the countries in direct relation to Africa, a view that is quite unfamiliar and rarely seen.

It is worth looking at Busby Fuller's maps or the Peters equal area proposals, among many other beautiful attempts to display geographical information. Numerous other side-by-side comparisons have been made, this is by far not the first and hopefully not the last such map; someone should find the best fit of all puzzle pieces in a neutral projection.

Use! then, please do not take it all too literal! (Where is Africa??) and simply take that one impression with you: Africa... is immense.



Top 100 Countries

Area in square kilometers, Percentage of World Total
Sources: Britannica, Wikipedia, Almanac 2010

