Opinion

Closer to the Reality: An Opinion on Africa’s Industrialization Drive

Cosmos Amoah**, Behrooz Asgari†

**Graduate School of Management, Ritsumeikan Asia Pacific University, Beppu, Japan

†Correspondence to: Cosmos Amoah, Graduate School of Management, Ritsumeikan Asia Pacific University, 1-1 Jumonjibaru, Beppu, 874-8577, Japan; Email: am22c2ii@apu.ac.jp

Received: December 4, 2023 Revised: January 10, 2024 Accepted: February 21, 2024 Published: April 2, 2024

Abstract

The return to economic normalcy is predicted to be a mystery tour. Economies must be intentional about their effort to restore economic recovery and must be done expeditiously. A common channel to maintain a resilient economy and promote growth is industrialization. Unfortunately, the story is Africa on the subject, despite wide coverage in research, seems stunted. In this paper, we express our opinion on the subject highlighting the essence of “intentional” effort as key to the industrialization process. We raise awareness that the most successful path to economic development is through industrialization and that it is only achievable through conscious efforts. We limit our discussions to a few selected policies and strategies premised on their unique importance to the debate, in our opinion. We show that numerous policies have been unsuccessful due to a “lack of intentional and deliberate efforts” and a failure to give ample time to the process. For each policy we discuss, we demonstrate that a bold, aggressive, and “whatever-it-takes” approach will yield thriving results.

Keywords: Africa, industrialization, intentional, innovation

1 INTRODUCTION

“An economic policy which does not consider the well-being of all will not serve the purposes of peace and the growth of well-being among the people of all nations”.

— Eleanor Roosevelt

The past decade has repositioned the world in economic and behavioral terms. The COVID-19 pandemic, climate change effects, supply change disruptions, increasing debt distress, weakening financial institutions, and tensions among nations have together sidetracked production, trade, and the global economy more generally. The payoff from these events varies, and outside of proximity and structure of international relations, much so depends on the countries’ degree of economic resilience and vulnerability built through industry-led strategies, or simply, strong industrialization policies. Strong industry-led economies have shown an average higher resilience as opposed to less-industrialized economies. Considering Noy and Yonson’s definition of economic resilience as “a country’s exposure to external shocks due to its inherent economic characteristics - economic openness, export concentration, and the dependence on strategic imports of the country in question” and economic resilience as “the economy’s coping ability that can, in contrast, be influenced by policies”, Diop et al. show that...
During COVID-19, the global downturn in demand, other than medical supplies saw agriculture commodity prices decline by 20% with many African economies forced to the dark side of the situation because most African economies are commodity-dependent[9]. Theoretically, the “Prebisch-Singer Hypothesis” teaches us that over time, “terms-of-trade” for primary commodities diminishes such that economic growth hinged on export of primary-commodities declines in the long term. If this assumption holds, Africa will suffer even more if no structural changes are made to its economic activities.

Knowingly, much of these risks the continent has been subjected to, and which has resulted in many economic plaques are resolvable with breathtaking industrialization policies and actions, much of which would rely on an “intentional” and “whatever it takes” approaches. As we know, the benefits of industrialization are enormous. For instance, industrialization catalyzes economic diversification which ensures non-reliance on a single sector such that risks are diversified easily[9]. Gaining such benefits requires an off-the paper effort which necessitates, for instance, actionable activities like the establishment of infrastructure, including transportation and energy networks. As we know, and succinctly expressed by Aschauer, robust infrastructure plays a crucial role in bolstering a nation’s resilience by facilitating the smooth operation of supply chains, transportation of goods, and overall economic activities[9].

The contribution of industrialization to society is a given, and extant prior studies have articulated extensively. When we consider industrialization to encompass the rise and growth of manufacturing activities, along with associated sectors such as construction and utilities[10], its benefits include: “engine of economic growth”[11,12], job creation too[13], poverty reduction strategy[13], and trade and export enhancer[14].

Embracing industrialization has traditionally proven to be an effective route for expediting the transition of countries into middle- and high-income economic brackets. The evidence has even been more revealing after the World War II. Relatedly, prioritizing policies centered around industrialization-driven structural transformation should be a key focus for Sub-Saharan African nations. Unfortunately, for decades, Africa has remained highly concentrated with less industrialized countries despite the obvious advantages of industrialization and the existence of numerous research seeking to promote industrialization in Africa. As we know, Africa, the world’s richest continent by natural resources is the world’s poorest continent. The irony of boasting rich resources, having a young and growing population to supply labor force, and renewal energy potentials is evident in its industrialization pursuit.

2 BRIEF HISTORICAL INSIGHTS OF INDUSTRIALIZATION IN AFRICA

For historical reasons, the onset of Africa’s industrialization can be traced back to period of colonization and post-independence. Following the struggle for independence and the onward desire to pursue self-development, industrial development emerged as the forerunner to strive for economic development[15]. Except where colonizers embraced industrialization, industrial development was generally discouraged during colonization. The Lagos Plan for Action, designed between 1980 to 2000 led the phase of Africa’s industrialization which coincided with the second and third phases of the 4th industrial revolution[16]. It has been obvious, especially in the fourth phase of the 4th industrial revolution where technology leads the industrialization process, that Africa has been left behind, however significant progress the region has made. The increasing emergence of frontier technologies and the fit into industrial applications have reprogrammed the input-output expectations of manufacturing, service, and the real sector more broadly. Given that Africa is projected to host more than a quarter of the world’s population by 2050 with over 60% as youth, consciously planned and intentional policies toward industrial development that recognizes the role of research and development (R&D), innovation and use of technology, and matched with skill training and acquisition, and infrastructure development will see the region glittering. Table 1 lists a number of industrial policies designed across the region.

Recalling a few recent economic outlooks for Africa, the service sector has recorded the largest contribution to the region’s economy for more than a decade (about 47%) while manufacturing value added has seen no significant improvement. The effect of the declining industrial contribution clarifies the extent of “jobless growth” observed even as growth spikes in the years to 2018; growth by the service sector has been inadequate to reduce extreme poverty[17].

3 THE MOTIVATION OF THIS OPINION

In spite of the late start, existing evidence points to the prospective growth-evolving industrial breakthrough the region can achieve. We intend to inspire the spirit of industrialization through recommendations underpinned by regionally-induced socio-economic characteristics. We also argue that the obvious key to a country’s riches is value addition to production. Poor countries are fond of
Table 1. Major Region-Wide Industrialization Policies in Africa

<table>
<thead>
<tr>
<th>Year</th>
<th>Industrialization Policy/Reform</th>
<th>Intended Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>The Lagos Plan of Action</td>
<td>To promote common African Market and improve domestic trade.</td>
</tr>
<tr>
<td>1981</td>
<td>1st Industrial Development Decade for Africa (IDDA I)</td>
<td>To respond to commodity crises of 1980s and make Africa self-sustaining.</td>
</tr>
<tr>
<td>1989</td>
<td>2nd Industrial Development Decade for Africa</td>
<td>To enhance the IDDA I; end overdependence of African countries on industrialized world.</td>
</tr>
<tr>
<td>1991</td>
<td>Abuja Treaty for African Integration</td>
<td>To coordinate and harmonize economic and social policies to enhance production structures.</td>
</tr>
<tr>
<td>1995</td>
<td>The Cairo Agenda</td>
<td>To increase the production, competitiveness, and diversification of the domestic private sector.</td>
</tr>
<tr>
<td>1996</td>
<td>Alliance for Africa’s Industrialization</td>
<td>To propose a framework for devising national industrial strategies with private sector focus.</td>
</tr>
<tr>
<td>2000</td>
<td>African Growth and Opportunities Act</td>
<td>To establish a trade relationship between Africa and the US</td>
</tr>
<tr>
<td>2004</td>
<td>Africa Productive Capacity Initiative</td>
<td>To propose an overarching model for sustainable industrialization in Africa</td>
</tr>
<tr>
<td>2008</td>
<td>Plan of Action for the Accelerated Industrial Development of Africa</td>
<td>Aimed at removing political hindrance to successful implementation of industrial development policies.</td>
</tr>
<tr>
<td>2018</td>
<td>African Continental Free Trade Area (AfCFTA)</td>
<td>To promote intra-African trade, streamline export rules and coordinate manufacturing effort.</td>
</tr>
<tr>
<td>2021</td>
<td>The African Fourth Industrial Revolution Standardization Strategy</td>
<td>To bridge the gap between physical and digital world, and promote the AfCFTA</td>
</tr>
</tbody>
</table>

selling raw primary commodities. Africa needs to move away from its current position at the bottom of the global value chains, and traverse toward fast industrialization, adding value to all or most of its products. The “Wealth of Nation”[18] and “Why Nations Fail”[19] provide clear evidence to our claim. Relationally, we submit that it will take ‘intentional’, “bold”, and “aggressive” effort to reach the imperial levels of industrialization, from which would come growth and richness, seen in all rich countries of today’s global economy. Inevitably, intentional industrialization was key, so will be the case of developing countries with no exception to Africa.

In the next sections, we provide relevant anecdote of Africa’s industrial development trajectory, shed lights on the extant problems, and suggest recommendations for policy and practice. Our recommendations are inexhaustive but practically revealing. Our aim is to communicate that deliberate effort to get policies work is inevitably pivotal in the process.

4 WHAT IS THE SITUATION? (A BRIEF OUTLOOK)

The UNIDO describes countries as “Industrialized Economies” and “Developing and Emerging Industrialized Economies”. By UNIDO’s rankings, no African nation is considered an industrialized economy. While this situation appears disturbing, it is not surprising as we know that a higher percentage of economies of the African continent are heavily dependent on commodity export; import nearly 24% of goods and services (vs export 23%), and very little intra-Africa trade is observed (around 15% of all trade). In Figure 1, the top 10 countries in terms of manufacturing output are shown. As mentioned above, no African economy comes close to this ranking. Figure 2 shows the top ten industrialized economies in Africa. Another intriguing evidence that deserves empirical and policy-driven attention is provide in Figure 3 where SSA records the least average manufacturing value-added to GDP ratio.

From the Competitive Industrial Performance (CIP) 2019, we learn that countries like Germany, China, the United States, Japan, South Korea, and the Netherlands rank among the top performing industrialized economies - rated in the top 10. The best-ranked African country is South Africa, and her position is 52nd followed by Morocco at 62nd and Egypt at 64th - another indicator showing that there is more room for improvement in the industrialization ecosystem of Africa. For explanation purpose, the CIP “can be taken as a rough proxy of countries’ underlying capabilities in manufacturing production. It combines three dimensions: the capacity to produce and export manufactured goods, technological deepening and upgrading, and world impact. The higher the score on any of these dimensions, the higher the country’s industrial competitiveness and its overall CIP Index score”. Under the given situation, and the obvious potentials, a study as we have provided is eminent.

5 WHAT IS NEEDED? (INTEGRATING INTENTIONS INTO POLICIES)

A number of policy-driven research and empirical studies have elaborated various policies that are needed to catalyze the industrial development of Africa. None has pioneered the opinion we hold, which is “Africa must be intentional, bold, and aggressive” about the industrialization agenda. No rich country today would be in its position without industrial development, which they were deliberate about. While we call out a few policies, some of which have been mentioned in industrialization literature, we stress
the importance of intentionality in each proposed policy or recommendation. Our recommendations, however bounded they are, are rather more pointed to localizing industrialization within the region which promise a wider potential to be globally competitive in the future.

5.1 Strategic Policy Coordination

As a continent of 54 countries, holding different views on economic and development policies is inescapable, industrial policies included. However, the richness of diversity of economic opinions and policies is in its ability to yield
substantial results in economic management and that has not happened in Africa yet. It is empirically evident that regional integration and coordination of industrial policies would be of significant benefit to Africa. Estimated benefits (including for instance a yield of USD 3.4 million in GDP) of the AfCFTA is a good example. We opine that an essential part of the contentions undermining successful industrialization and onward trade in the region is the persistent structural differences in government policies on industrialization and trade across the region. Ostry and Ghosh\cite{20} give reasons. They underscore that “the most compelling reasons are asymmetries in country size; disagreement about the economic situation and cross-border transmission effects of policies; and often policymakers’ failure to recognize that they face important trade-offs across various objectives”.

5.1.1 Our Proposal

We suggest governments across the region, through the AfCFTA and the African Development Bank (AfDB), “intentionally” coordinate efforts to design a mutually-beneficial regional industrialization policies driven toward enhancing intra-region trade, allowing for easy flow of resources, and coordinate investments to avoid excess capacity and unhealthy concentration of industries. A coordinated industrial development policy will erupt and protect infant industry, secure comparative advantage, and reduce or eliminate redundancy in investment in skills and machines\cite{21,22}. Under one industrial policy design, African economies have the advantage, guided by the comparative advantage theory, to identify areas of productive capability and pool resources needed from the length and breadth of the continent at reasonably cheaper cost. Furthermore, the broadening of global value chains signifies a growing segmentation of production. This segmentation renders it comparatively more feasible for African economies to concentrate on specific links within a global value chain, cultivating expertise in a variety of small, precisely defined items, without the necessity of possessing all the upstream capabilities\cite{23}. This is only possible under a coordinated industrial policy.

A coordinated policy approach to industrialization makes it less restrictive or rather more easier to transfer knowledge and know-how across the region from technically competent nations to highly potential regions to facilitate the maximization of value addition in Africa. The case of European Union industrial policy epitomizes the concerns we have raised. In the build to concretizing the European Union (EU)’s industrial policy, member states had varying state-aided industrial policy which appeared expensive and were politically challenging due to changes in government, a glaring feature of African economies\cite{24}. The EU introduced special rules that omitted governmental involvement into the market with some thought-through exemptions. The Treaty of Rome is a relevant example. According to Ambrozia\cite{25}, many policy makers and industrial practitioners have lamented that state aided industrial rules should be further relaxed to enhance the EU’s industrial competitiveness. We submit that strong treaty provisions should encompass already sponsored state industrial policies that shares common goals, at least at the initial stages.

The need for policy coordination is also rationalised by Baldwin and Martin\cite{25}. It is stressed that there are positive spillovers, especially of public good, when industrial policies are coordinated either as strategic substitute or complements. Take for example where two nations harmonize their industrial policies, R&D spending and outcome of one leave unintended benefit for the other especially in science and technology, as supported by the technology spillover theory and the diffusion of innovation theory.

In furtherance of our proposal, we contend that an involvement of a “neutral assessor” could be valuable in facilitating the reconciliation of disparate perspectives among national policymakers at a minimum disagreement level. The establishment of the AfCFTA and negotiation of the trade and investment protocols for the region must not end there. A coherent policy coordination on industrial development must be at the face of trade and investment related discussions.

5.2 A Common Currency Argument

When Kwame Nkrumah campaigned for a “One Africa” in the 1960s, and the onward creation of the African Union in 1963 under the theme “The Africa We Want”, Africa was expected to be “global powerhouse of the future”. This was to be done under the vision of “An integrated, prosperous and peaceful Africa, driven by its own citizens, representing a dynamic force in the international arena”\cite{26}. In its vision to create a “Single and Common African Market”, the role of a “common currency” would be paramount. There are about 41 different currencies in Africa. Many of these currencies are characterized by their lack of liquidity and infrequent trading activity on the global financial market, coupled with their inherent volatility. Consequently, flow of business and economic activity consistently faces challenges among African countries, and between African countries and the rest of the world. The challenges are that due to probable high transaction costs and exchange risk, funds are not transferred quickly and easily. To some extent, it discourages foreign direct investment which further decline the progress of industrialization in the region.

We agree with the challenges that currency union poses, and for instance note that marginal heterogeneity between African countries\cite{27} as well as potential loss of “monetary autonomy”\cite{28} pose a challenge to the process. Like the European union succeeded in 1999 with the introduction of “Euro”, it will take “intentional efforts” in restructuring macroeconomic fundamentals, however long it may be, to close the deal.
5.2.1 Our Proposal

We recommend the creation of a common currency carefully woven into the economic space of the continent where fiscal and monetary consolidation become possible. We maintain that this proposal is only possible with deliberate commitment from governments and existing economic blocs. Considering the “Euro”, the single currency for the European countries, the EU highlights “a single currency offers many advantages: it makes it easier for companies to conduct cross-border trade, the economy becomes more stable, and consumers have more choice and opportunities”. The EU reports that post World War II, the popular “common price system” of the European Economic Community was heavily threatened and further decayed by the oil shocks and other economic events until the establishment of the European Monetary System (EMS) in 1979. The EMS was to ensure stable exchange rates and facilitate the coordination of fiscal and monetary policies. After a long haul of preparations, the Euro was launched 1999 and enforced in 2002. Countries of the EU have since seen increasing trade, improved industrial ecosystems, and stable economic growth. This is replicable in Africa.

Theoretically, the optimum currency area (OCA) theory by Mundell in 1961[29] remains the most relevant theory underpinning currency union between countries. It is expressed by the OCA that currency union by two countries are only possible by the existence of symmetrical shocks. This means, for instance that the use of exchange rate for adjusting economic imbalances may be less effective if alternative mechanisms are non-existent and shocks are asymmetrical between countries. Subsequently, Kenen[30] stressed the mitigating role of diversification against shocks, and McKinnon[31] claimed that exchange rates between trading countries are stabilized if the volume of trade is high. Challenging the earlier claims by Mundell, the OCA theory was enhanced by Frankel and Rose[32]. Frankel and Rose submit that currency union is dependent on “trade intensity” between member countries. While Mundell’s argument favors the case of African economies because very similar shocks and levels of economic turnout have been experienced across the region, Frankel and Rose’s argument even further support our recommendation - common currency will ensure increased trade and productive capacity between and among African economies.

Empirical literature also supports the assertions in favour of common currency. Literature have disserted that adopting a common currency promotes trade, heightens price co-movements, and diminishes the co-movement of shocks in real gross domestic product[33,34].

Under the guidance of the African Union (AU), we further propose the establishment of overseeing body (call it “African Monetary Union (AFU)”) formed from the central banks across the region to spearhead the process of unionizing a common currency. Among other things, the mandate of the AFU, when created, should consider fostering the convergence of monetary policies. Relevant bodies like the AfCFTA and the AfDB should provide needed levels of support.

5.3 Prioritize and Embrace Innovation and R&D

Africa still lags behind the global invention capacity and innovation diffusion space. For instance, according to the Global Innovation Index (GII) 2022 and 2023 of the World Intellectual Property Organization, the only African economy that rose to the top 50 innovative countries was Mauritius (45th). For more explanation on GII, we suggest visiting Global Innovation Index and Amoah’s work on “innovate or die”[35]. Existing evidence suggests that Africa’s progress on innovation has been lagging despite the existence of numerous resources that serve as input for many innovations seen around the globe. On the innovation diffusion ladder, Africa can be described as “laggards”. The speedy evolution of artificial intelligence and frontier technologies are poised to reshape the “way of work” including manufacturing and service. Tragically, Africa has not matched up yet.

Innovation is largely measured by a countries’ R&D activities such as R&D expenditure, number of researchers, patents application, and technology export. Considering some of these indicators for the region, Africa has underperformed compared to its peer continents. Figure 4 illustrates the data on gross expenditure on R&D (GERD) as a percentage of GDP by region. As the evidence suggests, Africa lays below the world average R&D expenditure, and further below its peers, an indication that governments’ commitment and business sectors’ contributions to research activities in the region are far-fetched. Over the period (2015-2021), the average GERD was 1.81% globally, 1.97% for Europe, 2.96% for North America, and 2.53% for East Asia. Sub-Saharan Africa obtained 0.35% and North Africa scored 0.65%.

In Figure 5, we also show the number of researchers per million inhabitants across various regions. It also demonstrates that there is a huge gap between the region (Africa) and the rest of the world with Africa at the unfavourable end. On the averages, between 2015 and 2021, the number of researchers per million persons globally was 1,246, Europe secured 3,557, North America had 4,221, and East Asia had 1,933. Sub-Saharan Africa only managed 97 researchers per million persons and North Africa produced 731.

5.3.1 Our Proposal

The evidence of the significance of innovations and R&D for an enhanced industrial and productive economy is a common knowledge both in literature and practice. Highly industrialized economies such as China, the US, Germany, France, and India all have at the back of their progress so far,
an appreciable level of innovation progress and technology-induced economy. As industrialization works as the “engine for economic growth”, so is innovation for industrialization. Precisely, the 4th industrial revolution revolves around innovation and technology. Industries will grow and serve their purpose if there is continuous innovation and the creation of products that serve the needs of society. This requires significant levels of efficient investment in R&D. Highly industrialized economies are mostly R&D-intensive. Equally, firms’ ability to significantly navigate the road to successful sustainable industrialization hinges on their ability to accept, adopt, and use prevailing and emerging frontier technologies that enhance efficiency in production and manufacturing processes.

First, we propose a “start small” strategy for governments and private sectors of the nations within the region. The start small proposes that nations should begin an aggressive and intentional investment into R&D on sectors they have existing capacity and markets, and this should be done gathering the least possible resources and funding. The strategic collaboration of universities and research centers is a necessity in this approach. Region-wide partnership and collaboration should be enhanced further underscoring the need for policy coordination raised earlier in preceding sections of this study.

Second, we recommend intensifying the role of institutions providing both technical and financial supports to government and industries. The AfDB, the AU, and the AfCFTA, guided by a coordinated industrial policy, must lead negotiations for funding to support infant but promising industries to undertake innovative activities that are growth-enhancing and value-added driven.

Third, we campaign for a technology-led industrial ecosystem that will, at least, fit the 4th industrial revolution trend and make some significant catch-up, however marginal it might be. Simply put, firms must attempt to fuse technical changes in their operations in a parallel and gradual approach.

5.4 Rethinking Industrialization through Frontier Institutions

A nation’s growth and prosperity hinge on the presence of inclusive economic and political institutions. These institutions are not only indispensable but also imperative.
for any national agenda to succeed. We define a frontier institution as an entity whose direct or indirect actions through policies affect the viability of industrial development in an economy. These include institutes such as tax authorities, civil services, financial institutions, business registration departments, and export and import promotion authorities. In Africa, most “frontier institutions” have lost their relevance to the industrialization process due to loss of autonomy and increasing politicization and unfair government interference. In other situations, reports of corruption have emerged as major hindrance to the effective operations of frontier institutions. For instance, the 2022 “Corruption Perception Index” has over 35 African countries considered as very corrupt with a score of 34 or less.

5.4.1 Our Proposal

The role of what we describe as “Frontier Institutions” is paramount to any successful industrial development. They make laws, enact, and implement policies, and in some cases, represent the interests of industries. These institutions, as we agree with Acemoglu and Robinson, must be inclusive and growth-enhancing. Where state institutions have not allowed most of the people to participate in development-related processes and rather operated exclusively, growth have barely evolved. Taking financial institutions as an example, banks have been widely proposed through their intermediation role as “catalyst of industrialization.” The role of the financial institutions remains relevant to any industrializing society because the heterogeneous effect of the role of financial institutions on industrialization is considered to be positive. Exclusively, the success of industrialization in Europe is partly attributed to the role of financial institutions, specifically, banks. In Turkey, the failed role of the banking sector in providing funding support accounted for the ineffective export-oriented industrialization policy.

Also, tax policies proposed by tax authorities play a critical role enabling or hampering the success of industrialization. To this end, industrial policies must run concurrently with other economic policies such as tax policies. Favorable tax policies incentivize investment and nurture a favourable industrial atmosphere, while retreating tax policies inhibits the process. It is important to understand how tax policies can impact industrial growth and to design policies that incentivize private sector participation in the industrialization process.

We propose an establishment of inclusive frontier institutions that allows for democratic and constructive assessment and contribution from the public. Additionally, governments should play a role to enhance the quality of performance of these institutions than to interfere and weaponize them in favour of political ambitions. Intentionally, these frontier institutions should be empowered with technical and mobilization capabilities to be able to closely work with firms striving to promote industrialization.

6 CONCLUSION

Achieving the “Agenda 2063” remains the single-most important target of the African region. Since independence, the region has struggled in pursuit of the goals of the “Agenda 2063” despite the progress made. Industrialization which ensured the progress of the world’s rich countries, which will see Africa through the desired progress, has not convincingly evolved in Africa. From extant literature, we know the factors that drive industrialization and discourages the same. On how to get the region going with respect to industrialization, we establish the main hindrance has not been lack of knowledge on fitting policies. We contend that the major challenge is the lack of the willingness and intentional effort to implement relevant policies numerous times in literature. In the face of the current situation, we highlight, among several policy recommendation, that policy coordination, establishing and adopting common regional currency, encouraging innovation and technology-use across the board, and redefining the role of relevant institutions will be a good start get the region thriving in the industrial development process.

Acknowledgements

Not applicable.

Conflicts of Interest

The authors declared no conflict of interest.

Author Contribution

Amoah C designed and wrote the full manuscript. Asgari B proofread, and provided data and designed the charts. Asgari B also added to the various sections of the paper and deduced the conclusions.

Abbreviation List

AICFTA, African Continental Free Trade Area
AfDB, African Development Bank
AFU, African Monetary Union
AU, African Union
CIP, Competitive Industrial Performance
EMS, European Monetary System
GERD, Gross Expenditure on R&D
GII, Global Innovation Index
IDDA I, 1st Industrial Development Decade for Africa
OCA, Optimum Currency Area
R&D, Research and development
UNIDO, United Nations Industrial Development Organization

References
