3. Economic Diversification in Sub-Saharan Africa

Sub-Saharan Africa has made great strides over the past two decades, with high growth rates and significant progress on social indicators, driven by improvements in policy frameworks but also favorable commodity prices and financing conditions. However, in contrast to growth spurts seen in other regions, the growth acceleration in the region has not been driven by an expanding manufacturing sector. Moreover, growth spells in sub-Saharan Africa have been shorter than elsewhere (IMF 2017c) and, in some countries, conflict has slowed or reversed progress on economic diversification.

With commodity prices expected to stay low for long (Chapter 1), interest has been reinvigorated in the consequences and causes of structural transformation and export diversification among commodity exporters. Other countries in sub-Saharan Africa share this interest, focusing on the need for structural transformation as a pathway to sustained inclusive growth. Attention has focused both on the composition of output, with its implications for growth and domestic revenues, and on the composition of exports, which impacts the sustainability and stability of external inflows and therefore the balance of payments and economic volatility more generally.

In the debate over structural transformation and export diversification, a direct link between economic diversification and development is typically made. A common element is the shift of resources from low-productivity activities to high-productivity activities. The traditional view—based on transformation experiences in other parts of the world—is that resources should move first from agriculture to industry and then to services (for example, Hansen and Prescott 2002, McMillan and Rodrik, 2011, and McMillan, Rodrik, and Verduzco-Gallo 2014). Following this line of thinking, some authors caution that sub-Saharan Africa is on a path of premature deindustrialization, which could slow or even stunt development (for example, Rodrik 2015). An alternative view suggests reallocating resources from agriculture directly to services (for example, Carmignani and Mandeville 2010), given that manufacturing appears to be stagnating or declining as a share of GDP and employment, not just in sub-Saharan Africa, but also globally. Last, others (for example, Easterly and Reshef 2010) argue that (rather than shifting between sectors) sub-Saharan Africa should focus on moving up the quality ladder, which is an important factor underpinning growth in many low-income countries (IMF 2014).

Country experiences suggest a richer tapestry, with endowments defining starting positions for successful development strategies. Structural transformation and export diversification have to build on a country's comparative advantage. However, in some cases, structural transformation may lead export diversification; in others, export diversification can be the engine that drives structural transformation. Market size can be a limiting factor, with trade agreements providing opportunities to ease this constraint. Lastly, technological change may be redefining the "typical" path of structural transformation, with traditional sectors playing less of a role or a different role in some countries.

This chapter adds to the rich debate on economic diversification—structural transformation and export diversification—in emerging market and developing economies by focusing on sub-Saharan Africa. The chapter starts by providing an updated picture of structural change in the output and employment structures and the evolution of export diversification and quality in the region. While transformation and diversification are different aspects of development, the two are linked, and in the policy debate are often considered together. Next, the chapter traces the macroeconomic implications, showing that a more diversified economy in terms of production and export structure are associated with higher growth outcomes. In light of these results, the chapter then analyzes which policies promote structural change and export diversification.

This chapter was prepared by a team led by Axel Schimmelpfennig and composed of Wenjie Chen, Cristina Cheptea, Marwa Ibrahim, Lisa Kolovich, Yun Liu, Monique Newiak, Friska Parulian, Preya Sharma, Keerthi Yellapragada, and Jiayi Zhang.

The main findings are as follows:

- While sub-Saharan Africa has achieved a period of strong growth, structural transformation has been slower than in other regions. The primary sector is larger and the manufacturing sector is smaller than in global peers and, in some countries, has declined in recent years. Still, workers have moved from low-productivity agriculture into higher-productivity manufacturing and services jobs, contributing to overall productivity growth.

- These patterns are mirrored in trade developments. Sub-Saharan Africa trails other regions in the export-to-GDP ratio, export diversification, export quality, and export complexity.

- This aggregate picture, however, masks the significant progress achieved in the region's other resource-intensive economies and non-resource-intensive economies. Some of these countries have achieved diversification at a similar pace to global peers. The region's commodity exporters, on the other hand, have seen increased specialization in exports, of primary commodities, reflecting higher prices and new production.

- Why worry? Because structural transformation and export diversification are positively associated with growth at early stages of development. Moreover, structural transformation and export diversification are linked. Trade flows are lower where the exporting country has a relatively small manufacturing sector and where exports are less diversified.

- Against this backdrop, the chapter concludes by identifying policies that are associated with structural transformation and export diversification. Cross-country data suggest that macroeconomic stability, access to credit, good infrastructure, a conducive regulatory environment, a skilled workforce, and income equality are all associated with higher economic diversification. Oil dependency, on the other side, is associated with less diversification.

- Country experiences illustrate the importance of these general recommendations and emphasize that the right policy mix is dependent on country-specific circumstances. Successful policies build on a country's endowments and existing strengths and an enabling environment that allows the private sector to expand. They work best when they tackle specific challenges that firms face. At the same time, structural transformation and export diversification are not the only path to higher growth. Leveraging existing strengths, including natural resources, can also advance the development agenda.

PATTERNS OF STRUCTURAL TRANSFORMATION AND EXPORT DIVERSIFICATION

Structural Transformation in Sub-Saharan Africa Has Been Slower Than in Other Regions

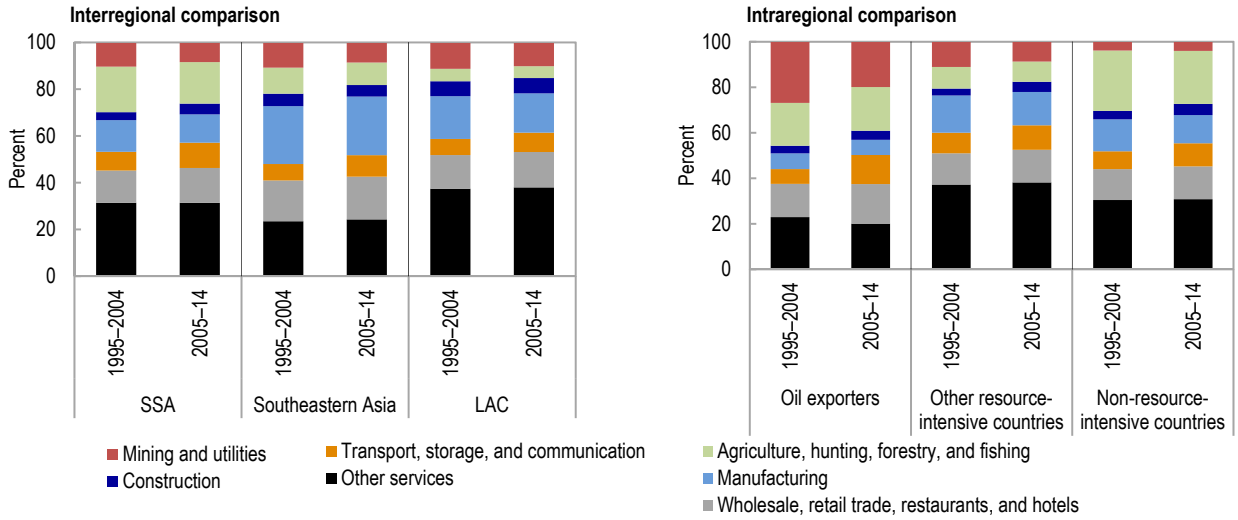
To understand the evolution of structural transformation, it is necessary to look at the different shifts that have taken place in sub-Saharan Africa's output and employment structure.

Compared with other emerging market and developing economies, the share of the primary sector in sub-Saharan Africa's real GDP is large, while the share of manufacturing is generally smaller and that of services higher, in particular relative to southeast Asia (Figure 3.1). The share of the manufacturing sector in sub-Saharan Africa and Latin America and the Caribbean has declined over the past decade, while it has stayed broadly constant in southeast Asia.

Within sub-Saharan Africa, trends vary between country groups. In oil exporters, mining and utilities constitute, unsurprisingly, a large share of GDP, while manufacturing is smaller than in the rest of the region. Wholesale, retail trade, restaurants, and hotels; and the transport, storage, and communication sectors expanded over the past two decades. In other resource-intensive countries, the "other services" category dominates output, and the manufacturing sector is roughly on par with that in non-resource-intensive countries. In non-resource-intensive countries, the agriculture, hunting, forestry, and fishing sector and other services sector make up half of real GDP.

These output trends are broadly mirrored by movements of labor in sub-Saharan African

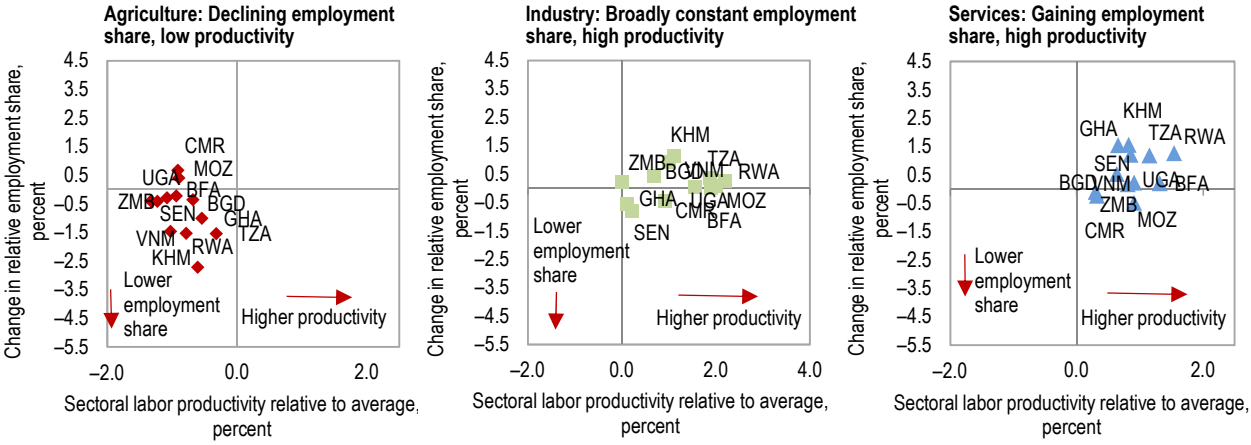
Figure 3.1. Sub-Saharan Africa: Real Sectoral Shares, 1995–2014 *(Percent)*



Sources: UN Statistics; and IMF staff calculations.

Note: SSA = sub-Saharan Africa, LAC = Latin America and the Caribbean. See page 76 for country groupings table.

Figure 3.2. Labor Productivity and Changes in Employment Shares, 2000 versus Latest *(Percent)*



Source: IMF 2017b.

Note: See page 78 for country abbreviations.

countries. Workers have moved out of low-productivity agriculture mainly into services, and to a lesser extent into manufacturing. Rwanda, for example, saw a 4 percentage point decline in labor shares in its agricultural sector and a matching 4 percentage point increase in labor shares in its services sector.[1] Movements into agroprocessing, which have occurred, do not show at this level of aggregation, since agroprocessing is included in agriculture.

Productivity in the receiving sectors is typically higher than in agriculture (Figure 3.2; see also Fox and others 2013).[2] Therefore, these patterns of structural change—from low-productivity agriculture to higher-productivity services—have had a positive impact on overall productivity growth in sub-Saharan Africa (McMillan, Rodrik, and Verduzco-Gallo 2014).

[1] Labor productivity calculations were based on combining sectoral output levels with corresponding trends in sectoral employment levels based on household survey data (IMF 2017b). These movements may not fully reflect developments in the informal sector. For an estimate of informality across sub-Saharan African countries, see IMF 2017a.

[2] Other parts of agroprocessing are included in the agriculture sector where they would constitute higher productivity activities.

Box 3.1. Different Measures of Diversification

This chapter uses four main indices to measure structural transformation and diversification in the region.

- The export product diversification index reflects the number of products a country exports and the extent to which the export structure is concentrated in a few products. By construction, lower index values indicate higher levels of export diversification. Mathematically, this is the Theil index of export diversification (IMF 2014), following Cadot, Carrere, and Strauss-Kahn 2011, which consists of a "between" and a "within"

$$Theil\ Index = \frac{1}{N}\sum_{i}^{N}\frac{Export\ Value_i}{Average\ Exp.\ Value}\cdot \ln\frac{Export\ Value_i}{Average\ Exp.\ Value}$$

$$= Theil_{between} + Theil_{within}$$

  subindex. In this equation, i is the product index and N the total number of products. The "between" Theil index captures the extensive margin of diversification, that is how many goods a country exports. Lower values represent a higher number of products in the economy. The "within" Theil dimension captures the intensive margin, that is how concentrated a county's export base is. Higher values represent a more concentrated distribution.

- The output diversification index is derived similarly to the export Theil index described above, using real subsectors from the United Nations sectoral database (IMF 2014).
- The export product quality index proxies the quality of a country's export products by the markup they command. Mathematically, the index is measured by the export's unit value adjusted for differences in production costs and the relative distance to the trading partner (Henn, Papageorgiou, and Spatafora 2013). The higher the cost a country can charge for its exports, adjusted for these factors, the higher the export quality according to this index. The index is normalized for each year to show export quality relative to the rest of the world, thus giving a relative ranking of each country for each year.
- The economic complexity index is a related concept that captures how diverse and complex the production of exports is, for example in terms of the technology used and the human capital required. The index is based on the number of other countries that produce a good. Mathematically, the complexity of goods is measured by their ubiquity; the fewer countries that export the product the more complex it is assumed to be (Simoes and Hidalgo 2011).

Export Diversification and Quality Indicators Show a Mixed Picture

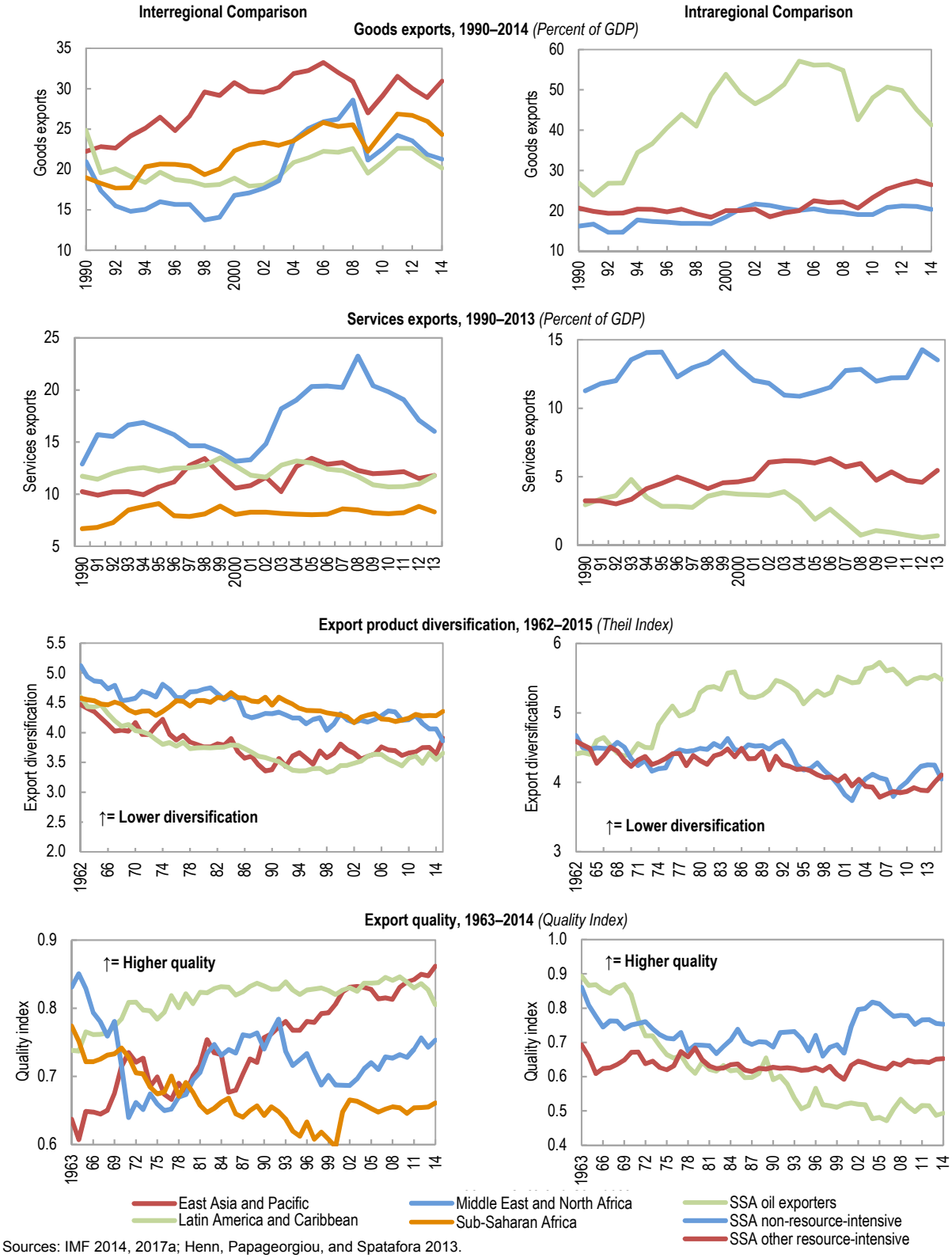
While output and employment shares provide a good overview of the overall structure of the sub-Saharan African economy, focusing on indicators related to the region's export structures provides insights into where countries have a competitive edge. In addition, trade data are available in more detail than data on the output structure, allowing for a more granular analysis.

We look at export shares, export diversification, and a measure of export quality, comparing sub-Saharan Africa with other regions. Export diversification refers to the variety of goods a country exports and how concentrated exports are, while export quality is proxied by the markup over costs (Box 3.1).

At the aggregate level, sub-Saharan Africa lags other regions in all but one area (Figure 3.3). Goods exports have increased as a share of GDP and are second only to the East Asia and Pacific region. However, service exports have remained flat as a share of GDP and are below those of other regions. Sub-Saharan Africa's exports are the least diversified, and export quality is the lowest. These trends are mainly driven by the oil-exporting countries and, for the export diversification index in particular, may be due to large fluctuations in oil prices.

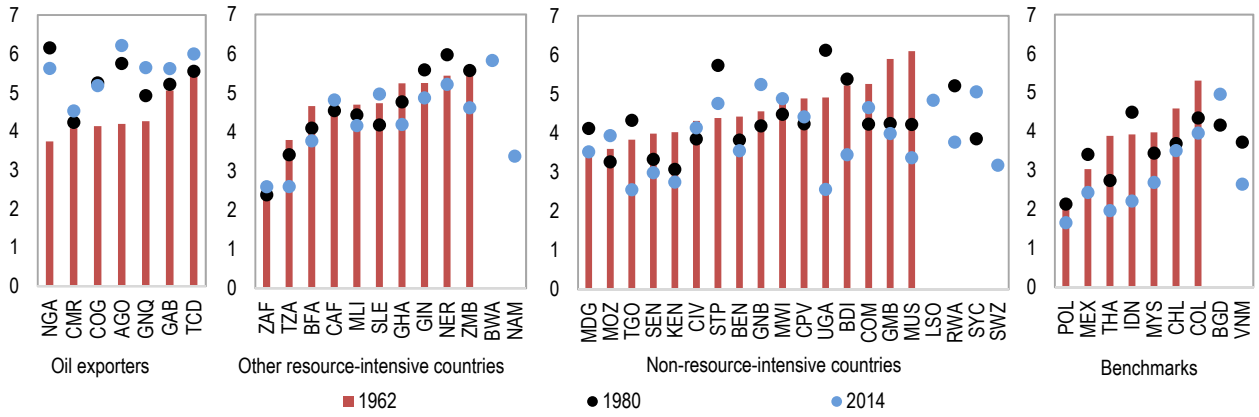
- *Oil exporters* have achieved a significant increase in their goods exports-to-GDP ratio, benefiting from oil discoveries and a relatively high oil price. With the dominant and increasing role of oil in these economies, service exports as a share of GDP, export diversification, and export quality have declined.

Figure 3.3. Measures of Export Diversification and Quality



Sources: IMF 2014, 2017a; Henn, Papageorgiou, and Spatafora 2013.
Note: SSA = sub-Saharan Africa. See page 76 for country groupings table.

Figure 3.4. Goods Export Diversification by Country, 1962–2014 *(Theil index; lower values = higher diversification)*



Source: IMF staff calculations.

Note: For Malawi, Tanzania, and Zambia the red bars represent the value for the diversification index in 1965; for Cabo Verde, Comoros, Equatorial Guinea, São Tomé and Príncipe, and Seychelles; blue dots represent the value for the diversification index in 2013. See page 76 for country groupings table and page 78 for country abbreviations.

- *Other resource-intensive economies* have seen increases in their goods exports and service exports to GDP ratios. Ghana, for example, more than doubled its services exports to GDP between the early 1990s and 2014. Export diversification and export quality have improved over the last 10 to 15 years, broadly in line with the start of the commodity supercycle.[3] The group is now at the top in sub-Saharan Africa in terms of export quality.

- *Non-resource-intensive economies* realized increases in their goods exports-to-GDP ratio until about 2000, with the ratio flat thereafter. Service exports rose from 11 percent of GDP in 1990 to almost 14 percent of GDP by 2014—more than twice the level realized in the rest of sub-Saharan Africa. Tanzania, for example, more than doubled its service exports-to-GDP ratio, mirroring the shift of labor towards high-productivity services. Personal travel, other business services, and air transport were the three largest sectors in 2014.[4] Export diversification increased steadily. The export quality indicator remained flat, suggesting that the group has kept pace with global developments in relative terms.

Zooming in at the country level, a few countries in sub-Saharan Africa have outperformed their peers in terms of export diversification in the past decades (Figure 3.4). For example, Mauritius was far less diversified than the average low-income and developing country in 1962, but has transformed from a mono-crop producer into an economy focused on manufacturing, and subsequently has become an important financial center in the region. Other countries that diversified their exports significantly over the past decades are members of the East African Community, such as Kenya, Tanzania, and Uganda, where efforts to diversify coincided with initiatives for more economic and regional integration. In fact, Uganda was among the least diversified countries in the region until the 1980s—a period when the country underwent episodes of civil conflict—but, by 2014, Uganda's level of diversification was on par with other emerging market and developing economies, such as Brazil and Mexico. Likewise, Kenya, Senegal, South Africa, Tanzania, and Togo are equally diversified as emerging markets, such as Chile, Indonesia, Malaysia, and Vietnam.

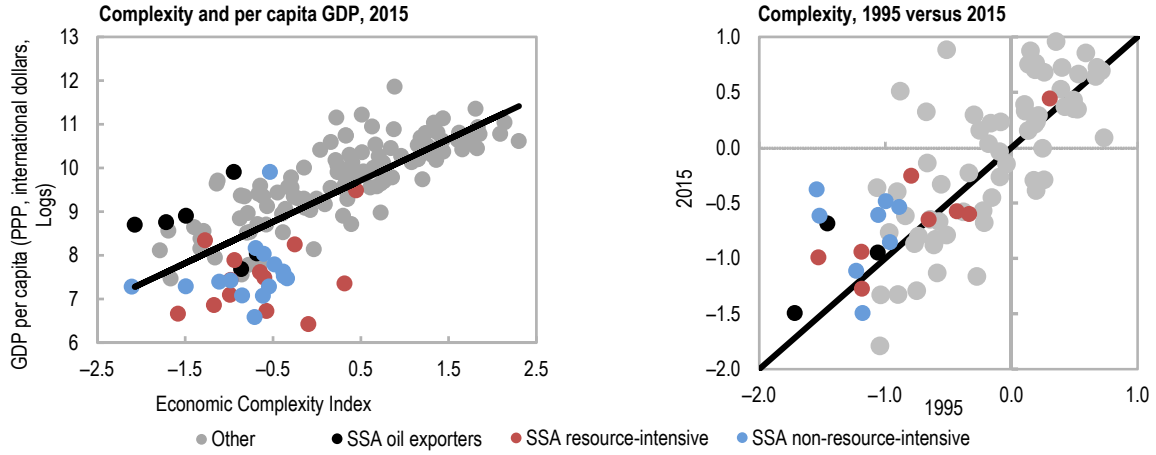
Export Complexity Is Rising but Still Trailing Other Regions

A complementary approach to looking at export diversification is the economic complexity index (Hausmann and others 2014). This index aggregates a country's exported goods, assigning a higher weight to goods that require greater underlying capabilities in their production, such as skills, knowledge, and infrastructure. For example,

[3] This may result from the construction of the quality index itself, which adjusts unit values based on differences in production costs and distance between trading partners.

[4] Across sub-Saharan Africa, travel and transport accounted for almost 70 percent of service exports in 2014.

Figure 3.5. Economic Complexity *(Index; higher values = higher complexity)*



Sources: Observatory of Economic Complexity; and World Bank, World Development Indicators.
Note: PPP = purchasing power parity; SSA = sub-Saharan Africa. See page 76 for country groupings table.

goods given the highest weight are machinery and appliances for specialized industries, while weight assigned to crude oil and cotton are among the lowest. Overall, complexity in sub-Saharan Africa is below that of other regions, although it has increased, particularly for non-resource-intensive countries (Figure 3.5).

Countries that have moved up in terms of economic complexity have tended to achieve that by producing goods that are more advanced, but require a similar set of existing underlying capabilities. To provide a systematic approach to assessing what types of products are more closely connected to each other, the "product space" network map shows all goods that are exported globally. Products closer to the center of the map, such as machinery and equipment, tend to be more complex to produce and more likely to be associated with underlying capabilities to produce a wider range of goods. In contrast, goods with lower complexity, such as commodities, tend to require fewer underlying capabilities and are located at the edge of the product space.

Southeast Asian countries have experienced some of the highest increases in complexity over time. For example, rapid growth in Thailand was accompanied by a transition from producing textiles to producing transport equipment and chemicals (Figure 3.6, panels 1 and 2).

Within sub-Saharan Africa, non-resource-intensive-countries experiencing the largest increases in complexity since 1995 include Kenya, Senegal, and Uganda (not shown) (Figure 3.6, panels 3 and 4) in part due to moving from exporting basic foodstuffs to more processed foods. Malawi (not shown) also experienced a notable increase in complexity over this period as production moved from textiles to machinery.

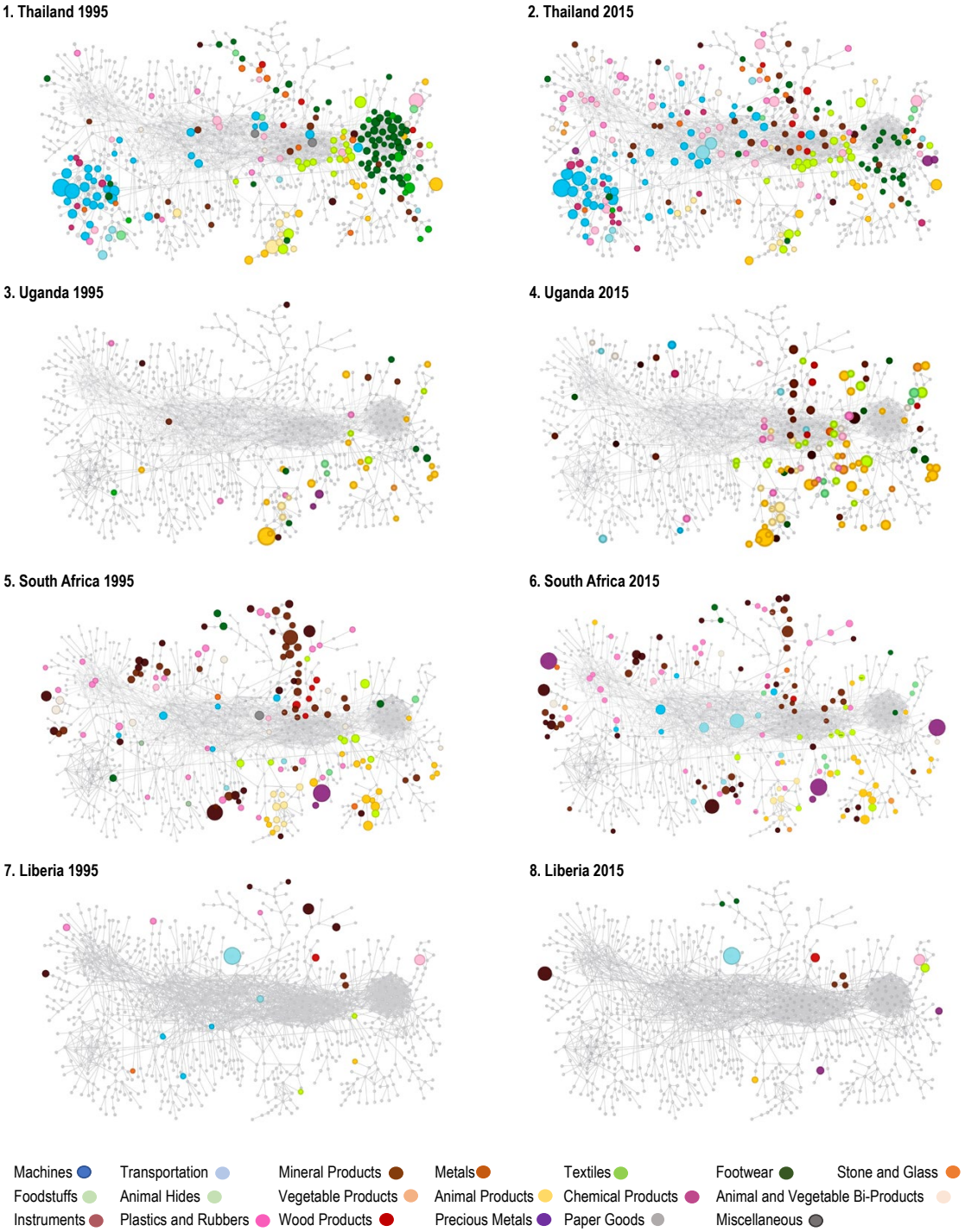
The country with the highest level of complexity in sub-Saharan Africa is South Africa (Figure 3.6, panels 5 and 6). In 1995, South Africa was already producing a wide variety of goods implying a broad set of underlying capabilities. This enabled exports to expand into a wider set of more complex products such as transportation goods (for example, cars and motor parts) and chemicals. In contrast, Liberia predominantly exported primary commodities that populate nodes at the outer edges of the product space, and there has been little change over, time (Figure 3.6, panels 7 and 8).

MACROECONOMIC GAINS FROM FURTHER ECONOMIC DIVERSIFICATION

Structural Transformation and Export Diversification Are Good for Growth

What do the trends discussed in the previous sections imply for sub-Saharan Africa's macroeconomy? At the global level, the link between growth and economic diversification is well documented for

Figure 3.6. Economic Complexity across Countries: Export of Goods, 1995 and 2015



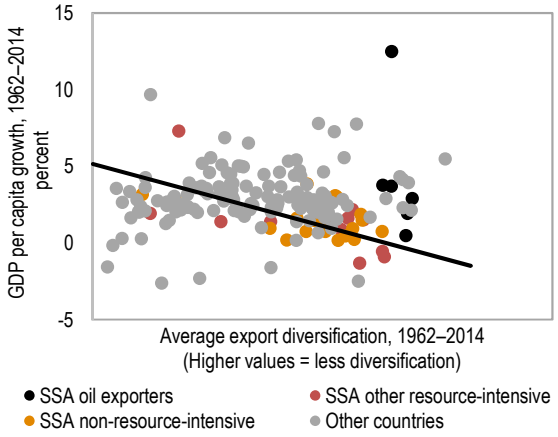
Source: Simoes and Hidalgo 2011.
Note: Gray = Overall product space; size of dot = proportional to size of respective sector.

low-income countries. For example, Cadot, Carrere, and Strauss-Kahn 2011 and the IMF 2014 find a positive relationship between export diversification and per capita income for countries at lower levels of development. Likewise, more diversified economies experience higher average growth at lower income levels (Figure 3.7). Structural transformation contributes directly to growth when resources move from low-productivity to high-productivity sectors. Economic complexity has also been associated with better growth outcomes (Anand, Mishra, and Spatafora 2012). Better growth outcomes, in turn, are consistent with longer periods of poverty reduction.

For small states, with small domestic markets and a narrow resource base, however, pursuit of diversification may not be the optimal strategy. Indeed, countries such as Cabo Verde, Mauritius, and Seychelles have managed to achieve higher income per capita with a moderate level of diversification—reflecting other factors, such as institutions and macroeconomic policies.

To analyze the relationship between economic diversification and growth, this chapter employs an approach that seeks to address the possibility of endogeneity and model uncertainty, closely following Eicher and Kuenzel 2016. This Instrumental variable Bayesian model averaging approach starts from a large set of potential explanatory variable as growth drivers. The analysis uses an unbalanced panel of 84 emerging market and developing economies, including 17 sub-Saharan African countries.[5]

Figure 3.7. Sub-Saharan Africa: Export Diversification and GDP per Capita Growth



Sources: IMF 2014; and IMF, World Economic Outlook database.

Note: SSA = sub-Saharan Africa. See page 76 for country groupings table.

The impact of the various measures of diversification on growth is presented in Table 3.1. Variables that show an inclusion probability of more than 0.5—which we interpret as evidence of an impact on growth (Eicher and Kuenzel 2016)—are highlighted in bold. All specifications also include traditional growth determinants such as initial GDP, investment, government expenditure, inflation, and the quality of institutions (see Annex 3.1).

Table 3.1. Explaining Economic Growth through Different Measures of Diversification in Developing Economies

	Export Diversification Index						Output Diversification	
	Total Theil		Between Theil		Within Theil			
	Inclusion Prob.	Cond. Mean	Inclusion Prob.	Cond. Mean	Inclusion Prob.	Cond. Mean	Inclusion Prob.	Cond. Mean
Export Diversification	0.102	–0.001	0.328	–0.012	0.146	–0.003		
Output Diversification							0.190	0.032
Diversification and Low Income	**0.951**	**–0.007**	**0.817**	**–0.026**	**0.907**	**–0.847**	**0.974**	**–0.148**
Div. and Lower Middle Income	0.094	0.000	0.179	0.009	0.115	–0.063	0.101	0.026
Div. and Upper Middle Income	0.065	0.008	0.063	–0.011	0.091	0.000	0.061	–0.002
Div. and SSA	0.208	–0.003	**0.906**	**–0.033**	0.258	–0.383	0.096	–0.006
Sargent test *p*-value	1.00		1.00		1.00		1.00	
Observations	583		583		583		531	

Source: IMF staff estimates.

Note: Other than diversification indices, initial GDP, investment, government expenditure, governance quality, population growth, and export quality index give a significant probability of more than 80 percent. For detail on full set of regressors, see the Annex 3.1. Variables that show an inclusion probability of more than 0.5 are in boldface type. Cond. = conditional; Div. = diversification; Prob. = probability; SSA = sub-Saharan Africa.

[5] Sub-Saharan African countries in the sample include Cameroon, Ghana, Gambia, Kenya, Malawi, Mali, Mozambique, Niger, Sudan, Senegal, Sierra Leone, Tanzania, Togo, Uganda, South Africa, Zambia, and Zimbabwe.

We find that:

- Diversification is linked to higher growth in low-income countries, but not in countries with higher income levels. A one unit improvement in export diversification (roughly the difference between Senegal and Thailand) is matched by 0.7 percentage point higher per capita GDP growth in low-income countries. Improvements in output diversification have a similar, possibly even stronger, positive impact on growth.

- Looking at the two dimensions of export diversification, expanding the variety of exports—the extensive margin of diversification—is associated with higher growth gains in sub-Saharan African countries than in the other countries in the sample. In contrast, the effect of having a less concentrated export structure—the intensive margin of diversification—is not different in sub-Saharan Africa from that in other low-income countries.

Structural Transformation and Export Performance Are Linked

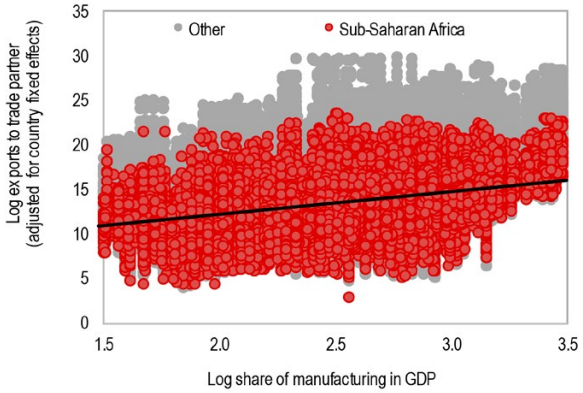
The stylized facts discussed so far in this chapter give rise to the question whether structural transformation and export performance are related (Figure 3.8). To test this link more formally, we augment a standard gravity model to explain goods exports with the share of manufacturing in the exporting country as well as measures of trade integration and diversification.[6] The starting point is the analysis in IMF 2015, using a global sample starting in 1980 and updated through 2014 (Annex 3.1). Accounting for other standard determinants of trade flows, the results suggest the following (Table 3.2):

- Goods exports are lower where the exporting country has a relatively low share of manufacturing in GDP. The association between manufacturing and trade appears to be weaker for low-income countries, possibly reflecting a large share of agriculture in exports, and the growing importance of service exports.

- Diversification goes hand in hand with an exporter's trade value. In particular, both the introduction of new product lines (the extensive margin of diversification) and a more balanced mix of existing products (the intensive margin) are significantly related to exports, with a stronger link at lower levels of economic development. This suggests that low-income countries may benefit overproportionately not only from expanding trade in existing sectors but also from tapping new sectors.

- The standard regressors included in gravity models of this type are significant with the expected sign: market size, common trade partner characteristics, determinants of trade costs, and institutions are strongly associated with exports.

Figure 3.8. Size of Manufacturing Sector and Trade



Source: UN Comtrade database.

Note: Figure shows residuals of the variables from their regression on country and time fixed effects.

Some countries, in particular in the East African Community's Kenya, Tanzania, and Uganda (IMF 2015, 2016), have made progress in integrating into global value chains. This process has been associated elsewhere in the world with higher levels of activity and income growth over time. In addition, Ethiopia, Kenya, Seychelles, South Africa, and Tanzania have seen the share of foreign value added in their exports increase by 5 percentage points or more in the past two decades. Sectors that have benefited the most from the deepening of integration include agriculture and agrobusiness (Ethiopia, Seychelles), manufacturing (Tanzania), and to a lesser extent textiles, transport, and tourism.

[6] In a gravity model, the dependent variable is the bilateral exports flow between an exporter and an importer. Explanatory variables include characteristics of the exporter and the importer as well as the distance between the two trading partners.

Table 3.2. Results from Bilateral Trade Regressions

1. Diversification Measures to the Set of Potential Drivers

	(1)	(2)	(3)	(4)
Lag Export Diversification Index	0.222 ***	0.159 ***		
Lag Extensive Margin			0.257 ***	0.118 ***
Lag Extensive Margin * LIC			0.230 **	0.164 *
Lag Intensive Margin			0.183 ***	0.148 ***
Lag Intensive Margin * LIC			0.166 ***	–0.0927 **
Lag Exporter ln Manufacturing Share		0.834 ***		0.876 ***
Lag Exporter ln Manufacturing Share of GDP * LIC				–0.393 ***
Constant	–24.60 ***	–25.93 ***	–23.90 ***	–25.30 ***
Observations	92,050	90,606	92,050	90,606
Number of Pairs	16,311	16,068	16,311	16,068

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

2. Standard Drivers of Bilateral Trade

Exporter ln (population) (lag)	+	Importer Landlocked	–
Importer ln (population) (lag)	+	Both WAEMU	+
Exporter ln (GDP per capita) (lag)	+	Both CEMAC	
Importer ln (GDP per capita) (lag)	+	Both SACU (lag 1)	–
Log of Distance	–	Exporter Infrastructure (lag 1)	+
Common Official Language	+	Importer Infrastructure (lag 1)	+
Common Language	+	Exporter Rule of Law (lag 1)	+
Common Colonizer	+	Importer rule of Law (lag 1)	+
Exporter Landlocked	–	Exporter ln (terms of trade)	+

Positive association | Negative association | No association

Source: IMF staff calculations.

Note: All regressions include the standard drivers depicted in panel 2. Export diversification Theil index transformed so that higher values denote higher levels of diversification. CEMAC = Central African Economic and Monetary Community; LIC = low-income country; SACU = Southern African Customs Union; WAEMU = West African Economic and Monetary Union.

The increase in the depth of integration in some of these countries is of a similar magnitude to that experienced by countries such as Poland or Vietnam—now success stories within large global value chains. In addition, the experiences highlight sectors—agrobusiness, light manufacturing, tourism, and textiles—with potential for sub-Saharan Africa to leverage its comparative advantage. For example, Gabon used a combination of policies, including business facilitation initiatives, to enter into public-private partnerships with an international agribusiness company. This partnership led to the development and operation of two large-scale agricultural projects, a special economic zone, and a fertilizer plant and is intended to boost non-oil exports going forward.

GETTING THE POLICY MIX RIGHT

The growth benefits identified above support the emphasis placed by many countries on achieving greater structural transformation and export diversification. But how to achieve this? We approach this question through a combination of cross-country empirical analysis and individual country experiences.

Breaking down the process of structural transformation and export diversification provides a starting point for the empirical analysis. At its core, economic diversification requires a reallocation of resources—capital, companies, workers—from one activity to another. Productivity gains can help release resources from existing activities—the same output can be produced with fewer inputs. And productivity gains can also provide incentives to reallocate to new activities where the rewards are higher. Information about opportunities then provides incentives to move from one activity to the next.

Many of the drivers of economic diversification are akin to drivers of economic growth, not surprising given that they are parallel and mutually reinforcing processes. With information and incentives in place, the ease of reallocation determines how fast economic diversification occurs. Capital and labor need to move; companies need to move or be set up. From this perspective, the overall investment climate and the ease of labor mobility facilitate (or slow) economic diversification. Other key factors include macroeconomic and political stability, the regulatory environment, infrastructure, human capital, and natural resource dependence.

This reasoning is consistent with other studies showing that economic reforms that improve the quality of institutions, reduce barriers to innovation, technology adoption, and trade—together with political stability and the right mix of macro policies—are associated with higher growth and diversification (Acemoglu and Robinson 2008; Christiansen, Schindler, and Tressel 2013; IMF 2014; Ostry, Prati, and Spilimbergo 2009; Prati, Onarato, and Papageorgiou 2013).

These relationships are tested formally in a panel of 92 countries of all income levels. We trace the links between economic diversification indicators and potential drivers discussed above. The choice of potential determinants was in part determined by data availability. The regression results are summarized in Table 3.3. Figure 3.9 illustrates some of the key relationships. It is important to keep in mind that economic diversification is a complex long-term process that is ultimately shaped by a country's idiosyncratic starting point. As such, it is not a relationship that is fully explained by a few common factors across countries. Our results suggest the following:

- Macroeconomic stability matters. In the scatter plot, high inflation is associated with lower export diversification, but the relationship

Table 3.3. Drivers of Economic Diversification

	Export Diversification			Output Diversification			Export Complexity		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Inflation	0.001	–0.028 *	–0.025	0.000	0.003	0.006	0.000	–0.019	–0.016
	(0.000)	(0.015)	(0.017)	(0.000)	(0.006)	(0.006)	(0.000)	(0.012)	(0.012)
External Debt	–0.003 *	–0.007	–0.000	0.000	0.000	0.000	–0.003 ***	–0.002	–0.000
	(0.002)	(0.004)	(0.004)	(0.000)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Exchange Rate Overvaluation	–0.948 **	–0.358	–0.354	–0.084	–0.224	–0.136	–0.471 ***	–0.632	–0.378
	(0.464)	(1.098)	(1.156)	(0.109)	(0.366)	(0.346)	(0.173)	(0.485)	(0.545)
Share of Oil in Total Exports	–0.024 ***	–0.026 ***	–0.031 ***	–0.003 ***	–0.003 **	–0.002 *	–0.011 ***	–0.011 ***	–0.011 ***
	(0.003)	(0.005)	(0.005)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)
Credit to the Private Sector	0.018 ***	0.011 **	0.009 *	0.001 ***	0.002 *	0.002 *	0.005 ***	0.003	0.002
	(0.003)	(0.005)	(0.006)	(0.000)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Access to Electricity	0.012 ***	0.014 *	0.015 **	0.001	–0.001	–0.001	0.008 ***	0.007 **	0.008 ***
	(0.004)	(0.008)	(0.007)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.002)
Literacy	0.005	0.001	0.006	–0.002 **	–0.002	–0.002	0.005 **	0.006	0.006
	(0.005)	(0.008)	(0.009)	(0.001)	(0.001)	(0.002)	(0.002)	(0.004)	(0.004)
Life Expectancy	0.005	–0.012	–0.021	0.001	0.008 **	0.012 **	0.001	0.000	–0.007
	(0.014)	(0.027)	(0.029)	(0.003)	(0.004)	(0.005)	(0.006)	(0.011)	(0.010)
Gini Coefficient	–3.642 ***	–4.293 **	–3.965 **	–8.007 ***	–7.578 ***	–7.689 ***	1.075 **	0.729	0.805
	(1.178)	(1.978)	(1.978)	(0.235)	(0.397)	(0.394)	(0.456)	(0.810)	(0.725)
Ease of Doing Business		0.673 ***	0.563 **		–0.001	–0.029		0.151 *	0.181 **
		(0.199)	(0.215)		(0.029)	(0.039)		(0.085)	(0.089)
Government Stability			0.139			0.004			0.036
			(0.091)			(0.016)			(0.034)
Voice and Accountability			0.210			0.085 *			0.254 **
			(0.235)			(0.045)			(0.101)
Internal Conflict			–0.206 **			–0.035 *			–0.024
			(0.094)			(0.020)			(0.036)
External Conflict			–0.017			0.043			–0.026
			(0.128)			(0.036)			(0.047)
Constant	8.541 ***	6.065	7.260	12.011 ***	12.122 ***	11.407 ***	0.620	1.205	0.588
	(2.343)	(5.467)	(5.944)	(0.594)	(1.694)	(1.680)	(0.814)	(2.313)	(2.764)
Observations	248	107	93	250	107	93	193	95	88
Number of Countries	92	74	60	92	74	60	92	74	60
***R* squared**	0.551	0.653	0.714	0.943	0.931	0.937	0.655	0.690	0.737

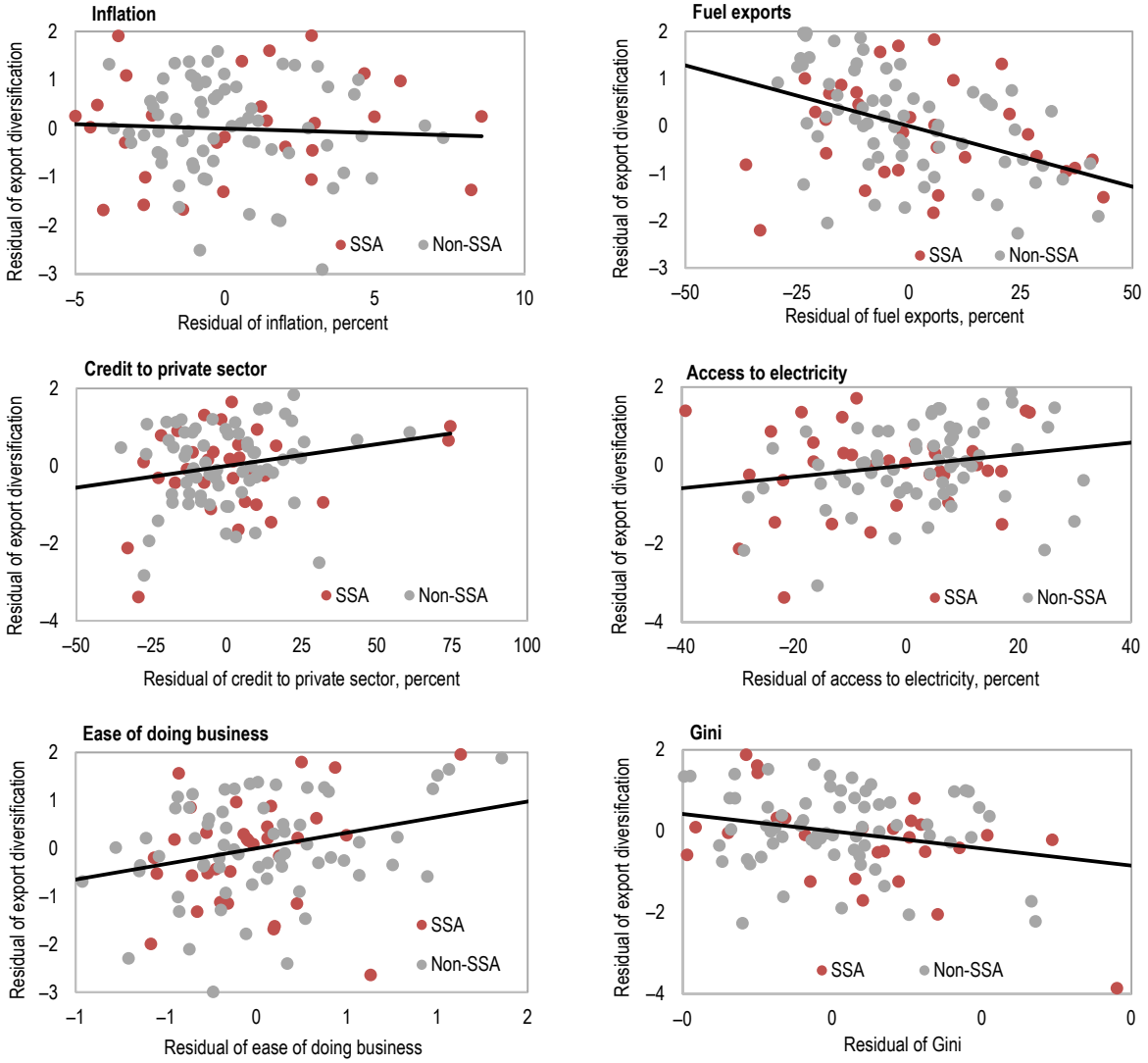
Source: IMF staff estimates.

Note: Robust standard errors in parentheses. Regressions are based on five-year averages between 1990 and 2014.***p<.01; **p<.05; *p<0.1.

is not statistically significant. There is some evidence that external debt holds back economic diversification.

- The strongest finding across specifications is that a high share of oil exports in total exports is matched by lower economic diversification. Natural resource endowments, when developed, do hold back diversification.
- The availability of credit facilitates economic diversification, underscoring the importance of financial sector development and stability for economic development and transformation.
- Infrastructure, here measured by access to electricity, is linked with higher economic diversification.
- The regulatory environment also matters, with the ease of doing business indicator being positively associated with economic diversification.
- Interestingly, we also find that higher income inequality holds back diversification.[7]

Figure 3.9. Drivers of Export Diversification



Source: IMF staff calculations.

Note: Observations and regression lines are conditional on all other regressors. SSA = sub-Saharan Africa.

[7] Similarly, Kazandjian and others (2016) find that gender inequality is negatively associated with both output and export diversification.

Country Experiences

Country experiences illustrate how a particular policy mix worked, given a country's circumstances but also a number of common themes. Macroeconomic stability serves as the backdrop for successful diversification episodes. Countries build on their endowments and existing strengths. Sound institutions form an enabling environment that allows the private sector to expand. Supportive policies work best when they tackle specific challenges that firms may face. Last, good infrastructure and investment in human capital allow the private sector to exploit new opportunities.

Mauritius

Mauritius has achieved an impressive structural transformation over the last three decades. Starting out as a mono-crop economy, Mauritius developed its agriculture sector, then branched out into tourism while at the same time laying the foundation for manufacturing-export-led growth and later becoming a regional financial center. Mauritius's transition from an agricultural-based economy was aided, for example, by: establishing Special Economic Zones (Export Processing Zones 1971; The Mauritius Freeport 1992; Cybercity 2005), a comprehensive public investment program in physical and human capital; and entering into trade agreements.

The further transition to an open and globally competitive services platform was guided by a reform package entailing, for example, a simplified, rules-based tax system with reduced import taxes and generous depreciation allowances to facilitate investment and growth of small and medium-sized enterprises. Labor market programs assisted with skills retraining and job placement in new emerging sectors. Furthermore, a legacy of sound economic and political institutions also helped guide the economic transition process. Consequently, Mauritius has become a globally competitive upper-middle-income economy.

Burkina Faso

Burkina Faso has successfully raised productivity in the cotton sector, thus raising growth in the sector to 22 percent a year between 1994 and 2006, compared with 12 percent during 1980–93. This contributed to a doubling of per capita GDP between 1995 and 2006. The cotton sector employs nearly 20 percent of the active labor force. Moreover, with virtually all cotton produced destined for foreign markets, improvements in the sector provided an important source of export growth. Even with the rapid increase in gold mining since the development of commercial gold operations over the last decade, cotton continued to represent 12 percent of total exports in 2016.

At the heart of the success of cotton in Burkina Faso is a reform model that deliberately tried to overcome financial, infrastructure, and scale constraints. Small-scale cotton producers, large cotton purchasing (and export) companies, and government collaborated in these efforts. The reform model was based on a mix of institution building, partial privatization, and the creation of complementary financial support mechanisms. What distinguished the reform process in Burkina Faso was the decision not to rapidly and completely privatize. Instead, reforms struck a balance between promoting competition, overcoming market failures, and establishing structures to facilitate cooperation.

A prefinancing fund was set up to overcome the financial constraints of small-scale cotton producers accessing credit. This Fund guarantees farmers access to seeds, fertilizer, and so forth, to start the planting season on affordable terms. The input fund also allows for improved bargaining potential through larger-volume purchases of inputs, as the cotton association purchases inputs for the entire sector in bulk, rather than farmers attempting to negotiate bilaterally. Farmers are guaranteed a price floor for their cotton, which provides an important source of risk minimization. The price floor is guaranteed by a Price Stabilization Fund, also operated by the cotton association, which pays out when global prices are below the floor and replenishes it when prices are above, thus providing an important source of hedging for producers who would be unable to do so individually. Both the Input Fund and the Price Stabilization Fund are designed to operate in a financially sustainable manner, but government and donor support was necessary at the inception and, at times, to maintain capital buffers.

Rwanda

Rwanda has channeled significant public resources into programs to boost growth, increase agricultural productivity, foster more access to financial services, and encourage higher-value economic activity. Infrastructure investment has focused on roads, electricity, access to the internet, and education, along with special enterprise zones to promote production of exports. The country has also embarked on a targeted strategy of public investment to promote Kigali as a regional and international hub for meetings, conferences, and exhibitions.

The strategy has borne fruit, with a noticeable shift of employment and output from basic agricultural to higher-value activity, especially services. Rwanda has experienced the fastest movement of labor across the two sectors among sub-Saharan African countries over the past 15 years. The sustained focus on high and inclusive growth, combined with maintenance of macroeconomic stability, has achieved tangible results over the past decade: growth rates have averaged 7.5 percent a year, close to doubling per capita income, and exports of goods and services have grown by 15 percent a year. At the same time, concerted policies have reduced gender inequality to the lowest level in sub-Saharan Africa, reduced poverty from about 60 to under 40 percent, and lowered income inequality. Due to extensive legal and structural reforms, Rwanda ranks number 2 in Africa in the World Bank's 2017 Doing Business indicators and fourth most improved country on the World Economic Forum's Global Competitiveness Index, garnering the highest scores for improving its institutional quality and labor market efficiency while diversifying the economy.

Recent public investments have included a large conference facility in Kigali and expansion of the national airlines for more intra-African routes and longer routes to India, China, and Europe. The aim of this public investment, which has increased debt ratios in the past five years, is to perpetuate Rwanda's growth momentum through stimulating more private-sector-led growth.

Uganda

Uganda's exports have traditionally been agrobased commodities, such as coffee. In recent years, the country has expanded into manufactured food, beverages, and tobacco products. Moreover, Uganda increased production and exports of light manufactured building products such as steel and cement to neighboring countries.[8] The government has supported this diversification by establishing and maintaining macroeconomic stability, expanding extension services, research and development, inputs and bulking, and marketing infrastructure. This is linked to development of industrial clusters along value chains and light manufacturing.

A number of formal policies have sought to facilitate diversification. The National Industrial Policy (2008) promotes manufacturing through emphasis on the application of science, technology, and innovation. The Uganda National Trade Policy (2008) aims at creating an enabling trade environment. The Leather and Leather Products Policy (2015) promotes the production and trading of value-added leather products and has boosted exports diversification. The improvement in electricity over time has helped to boost output surpluses, which have been exported to neighbors.

Economic diversification went hand in hand with a shift in the destination of exports, from western Europe to regional neighbors. In 1995, over three -quarters of exports went to Europe. Nowadays, half of Uganda's exports are to neighboring countries. Over this period, total export volumes grew on average by 10 percent a year. This shift in export destination suggests that when regional growth is strong, concentrating on regional trade integration can support diversification. The adoption of a customs union in 2005, conflict resolution in Sudan in 2005, and consequently the independence of South Sudan in 2011 have been supportive in enhancing regional trade.

Botswana

Botswana has leveraged its natural resource, diamonds, to promote diversification. Building on its dominant market position and a strong record of good governance and prudent economic management, the country has gradually expanded along the value chain for the diamond industry, including diamond trading, sorting, cutting, polishing, and retailing. There have been positive spillovers to supporting sectors such as manufacturing, trade, hotels, restaurants, and finance, which has given rise to

[8] See also Selassie 2008 for a discussion of Uganda's structural transformation.

some degree of horizontal diversification. Attempts to promote the expansion of sectors such as textiles and automobile parts were held back by capacity constraints and the fact that such sectors lacked current or potential comparative advantage. The key lesson is that policies to promote diversification are most likely to be successful in sectors that have some type of comparative advantage, including based on endowments.

Togo

Togo has long benefited from a diverse export base. The postindependence reliance on phosphate mining decreased as the country expanded into the mineral value-added production of clinker, as well as agricultural exports and varied light manufacturing. Based on its geographic location, Togo has traditionally had a strong transportation sector, taking advantage of both the east/west coastal corridor and servicing its landlocked neighbors to the north.

To foster further structural transformation, Togo has introduced industrial policies in the form of an export processing zone, streamlining business licensing and customs procedures, providing tax exemptions, and allowing direct contracting with foreign investors in mining. The government has also pursued an ambitious program of infrastructure investment in roads, the airport, and the deep-sea port. Buoyed by the notable infrastructure improvements, transportation service provision has grown and yielded spillovers that have strengthened exports.

However, the outcomes of the policies to promote transformation and diversification have been mixed. Capital expenditures, along with tax exemptions to spur foreign investment, have pushed up public debt. In the mining sector, clinker production by state-owned enterprises was turned over to foreign investors who have expanded production. Foreign participation in the rest of the mining sector, by contrast, has yet to produce significant results.

Considerations for Policy Design

These country experiences illustrate how political and macroeconomic stability, an enabling environment, and in some cases, policies that effectively tackle specific constraints or challenges contribute to economic diversification. Good infrastructure is a crucial ingredient for this process, allowing the private sector to exploit new opportunities and expand activities. Likewise, a workforce that has the right skills for such transformations and diversification is key.

At the same time, experience in many countries around the world suggest, that specific interventions often fail at a high fiscal cost and without generating growth or creating jobs. Power plants that are not connected to the grid, quality problems in construction that lead to delays and cost overruns, or efforts to kick-start activities for which the country has neither the endowments nor a comparative advantage are examples. Tax holidays and income tax exemptions have a poor record of attracting investment because they are not well targeted, but are costly in terms of revenue losses (IMF and others 2015). A tax system that is easy to comply with, however, is part of an environment conducive to business and likely much more important for economic diversification (for example, Dabla-Norris and others 2017).

The common elements of successful policy interventions are aligned with efficient public investment management: project selection based on sound analysis, project planning, and implementation. Structural transformation and export diversification do not happen overnight. They build on endowments and expand underlying capabilities, moving from one node of the economic complexity web to the next. As such, policies to foster economic diversification must to be based on a long-term vision and implemented in a steady and sustained fashion.

CONCLUSIONS

While sub-Saharan Africa trails other regions in most measures of structural transformation and export diversification, this aggregate picture hides important success stories within the region. Economic diversification has been slow in the oil-exporting countries during a time when they benefited from new discoveries and high oil prices. The other resource-intensive economies and the non-resource-intensive economies have done better, with some making impressive gains. Still, in many sub-Saharan African countries reliance on the primary sector is higher and the manufacturing sector is smaller than in other regions. At the same time, services are playing a larger role.

These findings have macroeconomic implications. Progress on economic diversification can foster growth and strengthen resilience. This holds in particular for low-income countries. Development paths for individual countries will differ, depending on their circumstances and starting positions.

Policies to achieve economic diversification depend on country circumstances. Macroeconomic and political stability combined with conducive infrastructure lays the foundation for the private sector to operate under certainty and take advantage of new opportunities. Access to credit allows for investment, including in new sectors and activities. An educated and healthy workforce facilitates mobility. Specific policies have to build on a country's starting point, its endowments and circumstances. In some cases, addressing market failures can help. Trade integration can open new markets and opportunities. A key to success is endurance and consistency. Structural transformation is a long-term process that functions best with long-term policies.

Annex 3.1. Methodological Notes and Data

Linking Trade in Goods and Manufacturing

To quantify the link between the exporter country's trade position and various diversification measures the section uses a gravity model, including robust fixed effects in which the dependent variable is the logarithm of exports from one country to another as reported by the partner country. The baseline estimation sample covers 177 reporting countries with 191 trading partners between 1980 and 2014. Following the specification in the April 2015 *Regional Economic Outlook: Sub-Saharan Africa*, we estimate the following specification:

$$\ln x_{ijt} = \beta^{Ex} M_{it-1}^{Ex} + \gamma^{Ex} Div_{it-1}^{Ex} + \beta^{Im} M_{it-1}^{Im} + \theta I_{ijt-1} + \nu_t + u_{ijt}$$

In which, x_{ijt} captures exports from exporting country *i* to importing country *j* in year *t, M_{it-1}^{Ex} and M_{it-1}^{Im}* are possible determinants of export volumes from the exporter's and importer's side (lagged by one year to address simultaneity concerns), I_{ijt-1} are factors that represent trade cost between bilateral trade partners, and ν_t and u_{ijt} represent time fixed effects and unobserved bilateral trade cost determinants, respectively. Finally, Div_{it-1}^{Ex} denotes the measures of diversification and output structure tested for in the analysis (sectoral shares, export diversification, and its subindices).

Robustly Identifying the Impact of Diversification on Growth

This section uses the unbalanced panel of 84 countries from 1965 to 2009 from Eicher and Kuenzel 2016 to test whether diversification, as measured by export and output diversification (Papageorgiou and Spatafora 2012), have an impact on average real GDP per capita growth (five-year averages), on top of the wide range of indicators previously identified as robust growth determinants in the literature. To address model uncertainty arising from the large number of possible candidate regressors (41 in total; regression table only reports regressor with probability > 0.5) and instruments, this chapter uses instrumental variable bayesian model averaging (IVBMA). IVBMA combines the instrumental variable and bayesian model averaging methodologies in a type of two-stage least square estimation that addresses model uncertainty in both stages. A detailed description of the methodology can be found in Eicher and Kuenzel 2016.

Endogenous regressors include export diversification indices (total Theil, between Theil, within Theil), output diversification index, interactions between diversification indices and income dummies, and sub-Saharan African dummy.

Exogenous regressors include income dummies (low income, lower middle income, upper middle income), life expectancy, fertility, regional dummies (east Asia, sub-Saharan Africa, Latin America), land near coast percentage, percentage land tropic, linguistic fractionalization, ethnic fractionalization, governance quality, religions fraction, expropriation risk, and legal system origins.

Instruments include log of land area, log of average population size, lag of log of population growth, lag of average ratio of investment to GDP, initial per capita GDP, lag inflation, lag of government expenditure, lag of education, lag of filtered openness, original fraction of religion, landlocked dummy, interaction dummies between income and landlocked, and interaction dummy between income and population.

Identifying Policies to Support Diversification

In assessing what policy matters for economic diversification, we use a simple regression model to capture the correlations between various explanatory variables and diversification measures. The choice of the explanatory variables is mainly based on past literature on drivers of economic growth, since the latter is highly correlated with economic diversification and structural transformation. The main regressors are grouped into macroeconomic variables such as inflation, misalignment in real effective exchange rate, external debt, and oil dependency; a financial variable of access to private credit, and infrastructure and human capital indices such as; access to electricity, literacy rate, life expectancy, and the measure of inequality via the Gini index. For a subsample of the data for which there were observations, we also include the Ease of Business index. The main dependent variable of interest is the measure of export product diversification, although we also conduct robustness checks with the other diversification measures of output diversification and economic complexity.

The data cover 92 countries between 1990 and 2014, and for each country we construct five-year averages for each regressor. A detailed description of the data can be found in Schimmelpfennig and others, forthcoming. Table 3.2 in the main text depicts the regression outcomes. Specifications 1, 4, and 7 include only the macroeconomic regressors, while specifications 2, 5, and 8 depict the main regressors of interest. Specifications 3, 6, and 9 include additional regressors on regulatory and political environments: IVBMA Regression for growth on diversification, the economic complexity index, and export quality (developing countries, 1965–2009).

Annex Table 3.1. IVBMA Regression for Growth on Diversification (Developing Economies, 1965–2009)

	Export Diversification Index						Output Diversification	
	Total Theil		Between Theil		Within Theil			
	Inclusion Prob.	Cond. Mean	Inclusion Prob.	Cond. Mean	Inclusion Prob.	Cond. Mean	Inclusion Prob.	Cond. Mean
Initial GDP	**1.000**	**–0.021**	**1.000**	**–0.022**	**1.000**	**–0.021**	**1.000**	**–0.021**
Investment	**1.000**	**0.015**	**0.999**	**0.012**	**1.000**	**0.015**	**0.987**	**0.012**
Government Expenditures	**1.000**	**–0.122**	**1.000**	**–0.122**	**0.992**	**–0.123**	**1.000**	**–0.145**
Governance Quality	**1.000**	**0.011**	**1.000**	**0.011**	**1.000**	**0.010**	**0.999**	**0.013**
Population Growth	**0.996**	**–0.060**	**1.000**	**–0.056**	**0.990**	**–0.063**	**0.986**	**–0.060**
Religion	**0.992**	**0.051**	**0.999**	**0.055**	**0.978**	**0.049**	**0.996**	**0.058**
Inflation	**0.831**	**0.000**	**0.849**	**0.000**	**0.813**	**0.000**	0.256	0.000
Export Diversification	0.102	–0.001	0.328	–0.012	0.146	–0.003		
Output Diversification							0.190	0.032
Interactions:								
Diversification and Low Income	**0.951**	**–0.007**	**0.817**	**–0.026**	**0.907**	**–0.847**	**0.974**	**–0.148**
Div. and Lower Middle Income	0.094	0.000	0.179	0.009	0.115	–0.063	0.101	0.026
Div. and Upper Middle Income	0.065	0.008	0.063	–0.011	0.091	0.000	0.061	–0.002
Div. and SSA	0.208	–0.003	**0.906**	**–0.033**	0.258	–0.383	0.096	–0.006
Sargent Test *p* –Value	1.00		1.00		1.00		1.00	
Observations	583		583		583		531	

Source: IMF staff estimates.

Note: Variables that show an inclusion probability of more than 0.5 are in boldface type. Cond. = conditional; Div. = diversification; IVBMA= Instrumental variable Bayesian model averaging; Prob. = probability; SSA = sub-Saharan Africa.

REFERENCES

Acemoglu, D., and J. Robinson. 2008. "The Role of Institutions in Growth and development." Commission on Growth and Development, World Bank Working Paper 10, Washington, DC.

Anand, R., S. Mishra, and N. Spatafora. 2012. "Structural Transformation and the Sophistication of Production." IMF Working Paper 12/59, International Monetary Fund, Washington, DC.

Cadot, O., C. Carrere, and V. Strauss-Kahn. 2011. "Export Diversification: What's Behind the Hump?" *Review of Economics and Statistics* 93: 590–605.

Carmignani, F., and T. Mandeville. 2010. "Never Been Industrialized: A Tale of African Structural Change," *Structural Change and Economic Dynamics* 31: 124–37.

Christiansen, L., M. Schindler, and T. Tressel. 2013. "Growth and Structural Reforms: A New Assessment." *Journal of International Economics* 89: 347–56.

Dabla-Norris, E., F. Misch, D. Cleary, and M. Khwaja. 2017. "Tax Administration and Firm Performance: New Data and Evidence for Emerging Market and Developing Economies." IMF Working Paper 17/95, International Monetary Fund, Washington, DC.

Easterly, W., and A. Reshef. 2010. "African Export Successes: Surprises, Stylized Facts, and Explanations." NBER Working Paper 16597, National Bureau of Economic Research, Cambridge, MA.

Eicher, T., and D. Kuenzel. 2016. "The Elusive Effect of Trade on Growth: Export Diversity and Economic Take-Off." *Canadian Journal of Economics* 49 (1) 264–95.

Fox, L., A. Thomas, C. Haines, and J. Huerta-Munoz. 2013. "Africa has Work to do: Employment Prospects in the New century", IMF Working Paper 13/321, International Monetary Fund, Washington, DC.

Hansen, G. D., and E. C. Prescott. 2002. "Malthus to Solow." *American Economic Review* 92 (4): 1205–17.

Hausmann, R., C. A. Hidalgo, S. Bustos, M. Coscia, S. Chung, J. Jimenez, A. Simoes, and M. A. Yildirim. 2014. "The Atlas of Economic Complexity—Mapping Paths to Prosperity." Cambridge, MA: MIT Press.

Henn, C., C. Papageorgiou, and N. Spatafora. 2013. "Export Quality in Developing Countries." IMF Working Paper 13/108, International Monetary Fund, Washington, DC.

International Monetary Fund (IMF). 2014. "Sustaining Long-Run Growth and Macroeconomic Stability in Low-Income Countries—the Role of Structural Transformation and Diversification." IMF Policy Paper, International Monetary Fund, Washington, DC.

_____. 2015. *Regional Economic Outlook: Sub-Saharan Africa*. Chapter 3. Washington DC, April.

_____. 2016. "Trade Integration and Global Value Chains in Sub-Saharan Africa: In Pursuit of the Missing Link." IMF Policy Paper, International Monetary Fund, Washington, DC.

_____. 2017a. "*Regional Economic Outlook: Sub-Saharan Africa*. Chapter 3. Washington, DC, October.

_____. 2017b. *Rwanda 2017 Article IV Consultation*: *Selected Issues*. IMF Country Report No. 17/214, Washington, DC.

_____. 2017c. *Regional Economic Outlook: Sub-Saharan Africa*. Chapter 2. Washington, DC, April.

_____, Organisation for Economic Coorperation and Development, United Nations, and World Bank. 2015. "Options for Low-Income Countries' Effective and Efficient Use of Tax Incentives for Investment." Washington, DC.

Kazandjian, R., L. Kolovich, K. Kochhar, and M. Newiak. 2016. "Gender Equality and Economic Diversification." IMF Working Paper 140, International Monetary Fund, Washington, DC.

McMillan, M., and D. Rodrik. 2011. "Globalization, Structural Change, and Productivity Growth." NBER Working Paper 17143. National Bureau of Economic Research, Cambridge, MA.

_____, and I. Verduzco-Gallo. 2014. "Globalization, Structural Change, and Productivity Growth with an Update on Africa." *World Development* 63: 11–32.

Ostry, J., A. Prati, and A. Spilimbergo. 2009. "Structural Reforms and Economic Performance in Advanced and Developing Countries," IMF Occasional Paper 268, International Monetary Fund, Washington, DC.

Papageorgiou, C., and N. Spatafora. 2012. "Economic Diversification in LICs: Stylized Facts and Macroeconomic Implications," IMF Staff Discussion Note, 12/13, International Monetary Fund, Washington, DC.

Prati, A., M. Onorato, and C. Papageorgiou. 2013. "Which Reforms Work and under What Institutional Environment? Evidence from a New Data Set on Structural Reforms." *Review of Economics and Statistics* 95 (3): 946–68.

Rodrik, D. 2015. "Premature Deindustrialization." NBER Working Paper 20935, National Bureau of Economic Research, Cambridge, MA.

Selassie, A. 2008. "Beyond Macroeconomic Stability: The Quest for Industrialization in Uganda." IMF Working Paper 08/231, International Monetary Fund, Washington, DC.

Simoes, A. J. G., and C. A. Hidalgo. 2011. "The Economic Complexity Observatory: An Analytical Tool for Understanding the Dynamics of Economic Development." Workshop at the Twenty-Fifth Association for the Advancement of Artificial Intelligence (AAAI) Conference on Artificial Intelligence, San Francisco, August 7–11.