The Capabilities Driving Participation in Global Value Chains

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Abstract

Global value chains have altered the nature of global trade and offer significant opportunities for developing countries to expand exports, access technology, and raise productivity. Policy makers rightly seek to understand what it takes to participate in global value chains. In practice, this means understanding what it takes to attract lead firms and upgrade to higher value-added activities. Recent literature has pointed to a range of underlying characteristics that may drive participation in global value chains. Using a modified factor-content methodology, this paper shows that proximity to markets, efficient logistics, and strength of institutions are among the most important capabilities. However, the paper also shows that each sector has a unique mix of capability requirements. Fixed structural characteristics limit the range of sectoral possibilities for a given country, but, by reducing policy-related gaps, a country may be able to increase its competitiveness for participating in global value chains. The paper applies the methodology to Southern African Customs Union countries, and demonstrates that, by filling gaps in underlying capabilities, these countries could increase participation in certain global value chain sectors.

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The Capabilities Driving Participation in Global Value Chains

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I. Introduction
The emergence of global value chains (GVCs) and their rapid expansion over the past two decades has transformed the global trade environment. GVCs involve task-based trade across multiple stages of the production process that take place across a number of different countries, in which multiple inputs and exports of intermediate goods and services are necessary to produce a final good, which may also be exported. This “second unbundling” of global trade (Baldwin 2011) was made possible by a combination of improved shipping technology, revolutionary changes in ICT, and global trade liberalization that enabled multinational firms to take advantage of differences in comparative advantage across locations to establish integrated networks of intra and inter-firm production and trade.

GVC-oriented trade is seen to offer significant opportunities for developing countries, especially smaller ones, to benefit from global integration by changing the nature of competitiveness. In the past, for a country to become an apparel exporter, for example, it would need design capabilities and textile mills; to export in the automotive sector, it would need to produce engines and all subcomponents, as well as have the scale to carry out assembly. Under the new GVC dynamics, a developing country can specialize in certain activities (sewing, specific components or subassemblies) within the chain and trade in intermediates. In this sense, GVCs denationalize comparative advantage (Taglioni and Winkler 2014), as global lead firms construct global production networks by exploiting the most competitive locations for specific activities.

Given this situation, and in an environment where developing countries are urged to “join” and “upgrade” in GVCs (Cattaneo et al. 2013), policy makers in developing countries rightly seek to understand what it takes to do so. And, in practice, this means understanding what it takes to attract lead firms to place stages of the production value-adding process in their country.2 Here, the advice remains a bit less clear in several ways. First, identifying what specific aspects of a country’s competitiveness matter most for GVC trade remains a question. Policy advice points to aspects like trade facilitation, trade agreements, non-tariff measures (NTM), contract enforcement, and property rights protection (OECD, WTO, and UNCTAD 2013; OECD et al. 2014; Cattaneo et al. 2013). On the other hand, the emergence of countries like Bangladesh and Vietnam as major players in global production networks suggests that it may be all about low wages and large labor forces; while the development of automotive value chains in Central and Eastern Europe points more to relative wages, technology, and proximity. This points to a second practical challenge – the fact that what drives competitiveness in GVCs is likely to vary across GVC sectors as well as across GVC positions (upstream or downstream). Finally, with competition for GVC investment taking place in a truly global market, factor competitiveness relative to other countries matters a lot.

To inform policy recommendations, the empirical research literature in recent years has begun to address the determinants of GVC participation but has yet to yield a clear picture. Most studies have focused on evaluating the importance of a certain characteristic, such as trade facilitation (OECD-WTO 2015), transport (Hummels and Schaur 2014), trade logistics (Saslavsky and Shepherd 2012), time zones (Dettmer 2014), technology gaps (Nakazawa et al 2014), or exchange rates or trade policy (IMF 2015; Orefice and Rocha 2014). A number of studies have looked at the determinants of production fragmentation in general.

2 Either directly through investment or indirectly by contracting with a supplier in the country.
(for example, Hillberry 2011) and of supply chain trade between countries (for example, Rahman and Zhao 2013). Other studies attempt to estimate the relative contribution of a host of possible drivers to GVC participation. Among the findings is that non-policy factors (structural characteristics like geography that cannot be changed in the short- or medium-term) matter more than policy factors (Kowalski et al. 2015). However, sector-level analysis is usually not conducted or conducted at a low level of sectoral disaggregation or while testing only a small range of possible drivers. Firm-level studies have assessed the determinants of offshoring strategies, identifying the importance of factors like productivity and both skills and capital intensity at the firm level (for example, Corcos et al. 2013; Defever and Toubal 2013; Jabbour 2012). Finally, a separate segment of the literature assesses GVC participation’s impact on economic outcomes such as growth and employment.

So while these studies, along with the policy literature on GVCs, give us a sense of what factors are likely to be important in determining GVC dynamics, the question of which specific drivers matter most and when they matter most for country-level participation in GVCs remains open. One of the reasons for this is that data that identify clearly what is and is not “GVC trade” are still problematic, despite the significant progress that has been made in recent years. Another reason is that there are significant links across many of these drivers, making endogeneity a problem.

In this context, the purpose of the following empirical exercise is to shed further light for policy makers on where to focus efforts to drive competitiveness for GVC participation. We do this by generating “revealed capability intensity” (RCI) measurements of traded goods, extending the traditional theory of factor-content of trade to account for the capabilities that would be most relevant in task-based trade, and utilizing these measurements to illustrate how underlying capabilities shape participation of Southern African Customs Union (SACU) countries in global value chains.

II. The factor content methodology and its extension

The traditional factor-content theory of trade is based on relative factor endowments, as expressed in the Heckscher-Ohlin theory of trade: countries export goods intensive in the factor with which they are well-endowed relative to other factors. In this paper, we draw on the methodology employed by Shiritori, Tumurchudur and Cadot (2010), which generated a quantitative measure of “revealed factor intensity” for each traded good from 1971 to 2003 with respect to physical capital per worker, human capital and natural resource endowment. Using this methodology, a product exported predominantly by countries that are richly endowed with physical capital, for example, would be “revealed” to be intensive in that factor.

The revealed capability intensity for each product $j$ for a given capability is summarized by the following equation:

$$k_j = \sum_i w_j^i c_i$$

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3 The SACU region includes Botswana, Lesotho, Namibia, South Africa and Swaziland.
where \( c_i \) is the capability level for a given country \( i \) and the weights \( w \) are given by:

\[
    w^i_j = \frac{x^i_j / x^i}{\sum (x^i_j / x^i)}
\]

where the numerator is the share of exports of good \( j \) in country \( i \), and the denominator is the sum of export shares of good \( j \) across all countries. This weight is a version of revealed comparative advantage (RCA) with modifications proposed by Hausman, Hwang and Rodrik (2007) in their measure of revealed technology content (PRODY). Whereas the denominator in Balassa’s original RCA index is the share of good \( j \) in world trade, in this variation, as in Shiritori, Tumurchudur and Cadot (2010), we use the sum of export shares across countries, which allows the weights to add up to one and eliminates the problem of large RCA values when values are very close to zero.\(^4\)

The discussion of factor endowments and international trade traditionally has been isolated to labor, human capital and physical capital. In this study, we extend this model to additional “factors”, or capabilities, that may determine involvement in task-based trade. Recent studies in development economics make a strong case for treating institutions, for example, as not only essential for development but also a factor input into the production process on par with physical and human capital. An economy in which firms can trust in enforcement of contracts and rule of law would be one in which economic actors can coordinate their actions. Applying the factor-content methodology to Eurasian exports, Lederman, Pathikonda and Rojas (2012) used a measure of institutional capital along with natural capital as additional factor endowments. With an increasing number of factor endowments, however, the applicability of the standard theory of comparative advantage decreases, as the endowments cannot be assessed in relative terms, making it difficult to fully judge the impact of relative capabilities on export patterns. Yet, by matching the capabilities of an economy to the goods exported by that same economy, we can begin to understand which capabilities are required for the export of which products.

The revealed factor intensity methodology comes with some inherent limitations. One item that calls for some caution in interpreting results is the presence of capabilities in an economy not used as an input in production of a certain good that show up as important if a country is a dominant producer, simply because it co-exists with other capabilities that are key inputs. Another problem is distortion of the revealed capability intensity estimates by export and production subsidies. As in Shiritori, Tumurchudur and Cadot (2010), we account for this problem by eliminating country-product pairs with “non-zero

\(^4\) Shiritori, Tumurchudur and Cadot (2010) mention two main limitations in using Balassa’s index or its variations: countries and commodities are double-counted and, secondly, they are based on gross exports instead of net exports. As that study points out, the double-counting actually makes little difference in practice, and therefore correcting for it is not necessary. The second limitation is among the topics covered in the following section.
nominal rates of assistance” using a database created by Anderson and Nelgen (2013), although this database applies only to agricultural products, where distortions are most prevalent.

Assessing the drivers of participation in GVC sectors then hinges on identifying so-called “GVC products” based on a list of traded products most likely to be included in cross-border production networks. The specific lists utilized, described below in the data section, are isolated to manufacturing sectors, where a predominant set of opportunities for developing countries exists. Being a snapshot of GVC activities at a point in time, agri-food and services cross-border value chains are not included, even though these chains constitute smaller, but increasingly important, opportunities for developing countries.

The utilization of gross exports from standard trade data stands in contrast with other studies on GVC participation, which utilize value-added data from input-output (I-O) tables. These I-O databases, including the World Input-Output Database (WIOD), UNCTAD’s EORA database, and OECD-WTO Trade in Value Added (TiVA), cover only a subset of countries participating in GVCs. Some studies on drivers of GVC participation utilize an I-O based “GVC participation index” by De Backer and Miroudot (2013), which sums the import content of exports and the exports of intermediate inputs (goods and services) used in third countries’ exports, taken as a share of gross exports. The use of trade data in this study allows for measurement of GVC participation at a higher level of disaggregation and country coverage. The use of gross exports also puts the focus in this study on the extent of participation in global value chains rather than the amount of value created in global value chains, an equally important issue associated with upgrading in production networks.

III. Framework and data

A. Capabilities that matter for GVC participation

Employing the above methodology, we focus on a set of capabilities that are most common in the theoretical, policy, and empirical literature on GVC trade. These are summarized in Table 1, along with the specific indicators chosen and their data sources. It is worth noting that because this analysis is carried out at the global level, some capabilities that may have a big impact on GVC trade and investment at a bilateral level – such as preferential trade agreements, bilateral investment treaties, common language, and time zone – are not included. The selection of capabilities to include in the analysis, and most importantly the specific indicators chosen to represent them, were also dependent on country coverage of the source data. Our final data set covers 87 countries, which together represent 81 percent of world trade in 2012.

The capabilities fall into three categories:

- **Fixed**: capabilities that cannot be changed by a country.
- **Long-term Policy Variables**: capabilities that can be changed gradually over a relatively long time horizon.
- **Short-term Policy Variables**: capabilities that can be changed directly through a policy shift or negotiations.
**Fixed capabilities** include proximity to markets and natural capital. Proximity to markets is given by a GDP-weighted measure of distance between countries, which was then indexed and inverted to become a measure of closeness. The value of natural capital\(^5\) in dollar terms was provided by the World Bank Wealth of Nations data set, with a custom update provided for Botswana. We use natural capital in aggregate terms rather than per-capita terms as the total amount of an extractable resource is likely to influence investors’ decisions.

**Long-term policy variables** include human capital, physical capital and institutional capital. Human capital is measured as average years of schooling of the population ages 15 and up. This is the most comprehensive set of human capital data available, as international test scores (PISA) are not available with similar country coverage. Physical capital stock per capita is based on gross fixed capital formation estimates from the World Bank, where initial capital stock is set by the rate of depreciation, growth rate and population rate, and accumulation is done using a perpetual inventory method. We elect to put physical capital in per-capita terms as it can serve as a proxy for productivity. Institutional capital is given by the World Governance Indicators (WGI) rule-of-law rating. This is admittedly an incomplete measure of institutional strength, as the WGI itself also covers voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality and control of corruption. In practice, however, these measures are highly correlated and we chose the measure that may best relate to the strength of the business environment.

**Short-term policy variables** include logistics (connectivity), wage competitiveness (labor costs), market access and access to inputs. The logistics measure is from the World Bank Logistics Performance Index (LPI), a widely cited international rating system. The measure is influenced by proximity to markets, so there is some overlap between the two indicators. Wages are measured by the World Bank Doing Business indicators’ minimum legal wage in dollar terms. Although unit labor costs were preferred as a measure of productivity-adjusted wages, there is no database with sufficient coverage of countries to be suitable. As the indicator is in dollar terms, exchange rate dynamics affect this indicator, including changes owing to lower demand for commodities in recent years. In selecting this as a driver of GVC participation, we also acknowledge that higher minimum wages could be a consequence of GVC participation as well as a driver. Finally, market access and access to inputs are estimates generated by Kee, Nicita and Olarreaga (2008, 2009), who calculated two measures of overall trade restrictiveness that account for tariff barriers and the ad-valorem equivalent of non-tariff barriers for countries and their trading partners. As these are aggregate measures focused on removal of trade barriers, they do not fully capture the impact of preferential arrangements with certain markets in affecting an industry’s prospects nor do they account for the impacts of deeper integration like investment flows and trade facilitation.

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\(^5\) This measure includes crop, pasture land, timber, non-timber forest, protected areas, oil, natural gas, coal, and minerals.
Table 1: Capabilities and the Indicators Used to Represent Them

| Category                                      | Capability                      | Indicator                              | Units               | Source                                           |
|-----------------------------------------------|---------------------------------|----------------------------------------|---------------------|-------------------------------------------------|
| Fixed                                         | Proximity to markets            | GDP-weighted distance                   | Kilometers*         | CEPII                                           |
| Natural capital                               | Total value of natural capital  | Current $US billion                    |                     | World Bank Wealth of Nations                     |
| Long-term Policy Variables                    | Human capital                   | Average years of schooling (>15 years old population) | Years              | Barro and Lee (2010)                            |
|                                               | Physical capital                | Capital stock per person                | 2005 $US thousands  | World Development Indicators (WDI) and World Bank staff calculations |
|                                               | Institutional capital           | Rule of Law                            | Rating from - 2.5 to 2.5 | World Governance Indicators                     |
| Short-term Policy Variables                   | Logistics/connectivity          | Logistics Performance Index             | Rating from 1 to 5  | World Bank LPI                                 |
|                                               | Wage competitiveness            | Minimum wage for a 19-year old worker or an apprentice | $US*               | World Bank Doing Business                       |
|                                               | Market access                   | Overall Trade Restrictiveness Index (of Trading Partners) | Uniform tariff equivalent of partner country tariff and non-tariff barriers* | Kee, Nicita and Olarreaga (2008, 2009) |
|                                               | Access to inputs                | Overall Trade Restrictiveness Index     | Uniform tariff equivalent of country tariff and non-tariff barriers* | Kee, Nicita and Olarreaga (2008, 2009) |

*Two variables were inverted from the source data to give all indicators have the same direction; a higher figure for all indicators signifies a higher capability level.

As alluded to above, some of these capabilities vary with one another across countries. The two fixed capabilities - natural capital and proximity to markets – seem to have no linear relationship (corr = 0.02). On the other hand, many of the “long-term policy variables” – human, physical and institutional capital – are correlated (Annex Table A2). In particular, physical and institutional capital often occur together (corr = 0.83). This means products found to be intensive in physical capital will typically also be intensive in institutional capital, and vice versa, because countries making those products will usually be abundant in both of these capabilities or neither of them. As for the policy variables, low labor costs and good logistics often exist in the other’s absence (corr = -0.71), but the other variables do not have a strong linear relationship with one another.
B. Classification of “GVC products” in product-level trade data

The GVC product codes in disaggregated trade data\(^6\) are compiled from lists generated by Athukorala (2010)\(^7\) and Sturgeon and Memedov (2011). The first list by Athukorala contains the parts and components in the UN Broad Economic Classification (BEC) Registry and the product list of the WTO Information Technology Agreement. The author then used firm-level surveys from Thailand and Malaysia to refine the list. The registry has been used a number of times to measure GVC trade, as in a recent paper by Wignaraga, Kruger and Tuazon (2013). The second list by Sturgeon and Memedov (2011) has broader sectoral coverage. Using the BEC registry, the authors combined capital and consumption goods into a single “final goods” category and then isolated “differentiated, customized, product-specific” intermediates.

To get the broadest measure of GVC products, we combine the two lists of GVC codes.\(^8\) In total, the Athukorala’s list provides 500 product codes and the Sturgeon and Memedov’s list provides 860 product codes. Duplicate codes were removed, resulting in 1,236 product codes. Table 2 shows the breakdown of the 1,236 GVC products by sector. Our list spans 12 key manufacturing product categories: chemicals, plastic/rubber, hides/skins (which includes leather goods), wood, textiles, clothing, footwear, stone/glass, metals, machinery/electronics, transport (which includes rail, road vehicles, aircraft and ships), and miscellaneous manufactures (which includes furniture). Two GVC sectors – wood and chemicals – comprise only one product. As shown in Annex Table A3, global trade in electronics, transport, clothing and footwear largely takes place within the context of GVCs and seldom outside that context (93 percent of footwear and 88 percent of clothing exports are traded as part of GVCs).

Table 2: Number of GVC and Non-GVC Product Codes by Sector

| HS Category      | GVC | Non-GVC | Total |
|------------------|-----|---------|-------|
| 01-05 Animal     | 0   | 193     | 193   |
| 06-15 Vegetable  | 0   | 312     | 312   |
| 16-24 Foodstuffs | 0   | 178     | 178   |
| 25-27 Minerals   | 0   | 147     | 147   |
| 28-38 Chemicals  | 1   | 735     | 736   |
| 39-40 Plastic / Rubber | 12  | 177 | 189 |
| 41-43 Hides, Skins | 5  | 58      | 63    |
| 44-49 Wood       | 1   | 218     | 220   |
| 50-60 Textiles   | 320 | 194     | 514   |
| 61-63 Clothing   | 233 | 58      | 291   |
| 64-67 Footwear   | 42  | 13      | 55    |
| 68-71 Stone / Glass | 6  | 181     | 187   |

\(^6\) We use importer records tabulated from UN Comtrade considered to be more accurate than the corresponding exporter records.

\(^7\) Athukorala, Prema-Chandra (2010). “Production Networks and Trade Patterns in East Asia: Regionalization or Globalization” ADB Working Paper Series on Regional Economic Integration, No. 56. This was compared to another set of products coded by Sturgeon and Memedovic (2011). Athukorala coded a greater number of network products, although mainly focused on parts and components. There was only minor overlap between the two coding systems.

\(^8\) The original lists by Athukorala in HS 1996 nomenclature and Sturgeon and Memedov in SITC Revision 3 nomenclature were converted to a common HS1988/92 nomenclature using a concordance table.
Entering a sector at one position in the chain may not require the same capability bundle as another position in the chain. For this reason, we further divide certain sectors into final and intermediate stages. While this does not account for all the steps in a value chain, it does account for some of the most important differences. Table 3 provides a breakdown of final products and intermediate products within each of the main GVC sectors. Four sectors with a substantial number of both final and intermediate GVC products – transport, footwear, machinery and miscellaneous manufactures – are divided into final and intermediate sub-sectors in the following pages. Since wood and chemicals comprise only one product and make up only 0.3 percent of the value of global GVC trade, we exclude them from subsequent analysis.

**Table 3: Number of Products by Position in Value Chain within GVC Sectors**

| Sector                        | Total Number of GVC Products | Final Products | Intermediate Products |
|-------------------------------|------------------------------|----------------|-----------------------|
| 39-40 Plastic / Rubber        | 12                           | 0              | 12                    |
| 41-43 Hides, Skins            | 5                            | 4              | 1                     |
| 50-60 Textiles                | 320                          | 0              | 320                   |
| 61-63 Clothing                | 233                          | 231            | 2                     |
| 64-67 Footwear*               | 42                           | 29             | 13                    |
| 68-71 Stone / Glass           | 6                            | 0              | 6                     |
| 72-83 Metals                  | 33                           | 0              | 33                    |
| 84-85 Machinery/Electronics*  | 360                          | 50             | 310                   |
| 86-89 Transport*              | 56                           | 14             | 42                    |
| 90-97 Miscellaneous Manufactures* | 167                        | 90             | 77                    |
| **TOTAL**                     | **1234**                     | **418**        | **816**               |

Source: Authors’ calculations

*These four sectors are divided between final and intermediate stages in subsequent analysis.

This remainder of this paper is structured as follows. First, using the framework outlined above, we investigate which capabilities matters most for participation in GVCs – overall and within the 14 sectors identified (the 10 main final assembly sectors plus 4 intermediate sectors). Then, we use the example of countries within the Southern African Customs Union (SACU) to illustrate how capabilities of these countries compare to other regions more involved in GVCs. This analysis gives a sense of the sectors SACU countries might target to advance their participation in GVCs, and which capabilities they might need to...
build in order to do that. Additional analysis not undertaken in this paper could further establish sector targets and specific policies required.

IV. Results

A. Which capabilities matter most for GVC participation overall?

GVC participation is to a great extent the result of the available mix of capabilities in the economy. Some capabilities may matter more than others. For each traded product, our database of revealed capability intensities (RCI) provides a measure of the extent to which each of the nine chosen capabilities is associated with the export of each GVC product, on a global basis. Taking these RCI estimates, we run a test of statistical significance between GVC products and non-GVC products on each capability. Table 4 shows the results. Confirming our expectations, nearly all of these capabilities assessed in this study are important for participation in GVC trade. Overall, logistics, proximity to markets and strength of institutions seem to be most important. Even though they are not considered significant, we choose to leave wages and market access in the model because these two capabilities are likely to be important at the sector level even though they do not appear to be significant at the aggregate level.

Table 4: Revealed Capability Intensity (RCI) of GVC Products versus Non-GVC Products

| Category                      | Capability             | GVC Products  | Non-GVC Products |
|-------------------------------|------------------------|---------------|------------------|
| Fixed                         | Proximity to markets   | 0.0085***     | 0.003            |
|                               | Natural capital        | 0.0061***     | 0.0024           |
| Long-term Policy Variables    | Human capital          | 0.012***      | 0.0035           |
|                               | Physical capital       | 0.0079***     | 0.0042           |
|                               | Institutional capital  | 0.0113***     | 0.0033           |
| Short-term Policy Variables   | Logistics/connectivity | 0.0157***     | 0.0046           |
|                               | Wage competitiveness   | -0.0052       | -0.0036*         |
|                               | Market access          | 0.0048        | 0.0037           |
|                               | Access to inputs       | 0.0044**      | 0.0006           |

Source: Authors’ calculations

In this study, we differentiate between final and intermediate stages of the value chain. Historical experience suggests that only after becoming adept at final assembly using imported parts and components, then generating a local supplier base and acquiring a greater set of capabilities, countries begin to produce and then export intermediate products (Kaminsky and Ng 2005, Pathikonda 2011). Consistent with this understanding, the intermediate GVC products have greater capability requirements: they embody six of the nine capabilities to a greater degree than final products, as shown below in Table 5. As expected, wage competitiveness and access to inputs are more important for the export of final products. There is no significant difference between final and intermediate products on natural capital.
Table 5: Revealed Capability Intensity (RCI) of Final versus Intermediate Products

| Category             | Capability              | Final GVC Products | Intermediate GVC Products |
|----------------------|-------------------------|--------------------|--------------------------|
| Fixed                | Proximity to markets    | 0.049              | 0.372***                 |
|                      | Natural capital         | 0.206              | 0.244                    |
| Long-term Policy Variables | Human capital    | 0.087              | 0.189***                 |
|                      | Physical capital        | -0.066             | 0.227***                 |
|                      | Institutional capital   | -0.02              | 0.24***                  |
| Short-term Policy Variables | Logistics/connectivity | 0.141              | 0.484***                 |
|                      | Wage competitiveness    | 0.076***           | -0.13                    |
|                      | Market access           | -0.08              | 0.099***                 |
|                      | Access to inputs        | 0.238***           | 0.194                    |

Source: Authors’ calculations

*** Indicates statistically significant difference at p < 0.01.
** Indicates statistically significant difference at p<0.05.
* Indicates statistically significant difference at p<0.1.

B. Which capabilities matter most for GVC participation, within sectors?
Circumstances that give rise to GVC participation vary by sector. We present RCI estimates for each of the 14 GVC sectors. Aggregated across products, the sector-level RCI is the average of product-level RCIs, weighted according to trade value. Table 6 shows that sectors like transport and machinery/electronics are associated with higher levels of capabilities like human, physical and institutional capital than sectors like clothing and textiles. Wages and access to inputs are shown to be most important for clothing. Proximity to markets and natural capital are most important for textiles. Figure 1 then graphically depicts requirements in four of the largest GVC sectors – electronics, transport, clothing and textiles – to help visualize which capabilities are most associated with which sector, but also to show that total capability requirements (all capabilities added up) are higher for more technology-intensive sectors like machinery/electronics and transport compared to clothing and textiles.

There are a few anomalies in Table 6 for reasons described earlier. For example, market access is not shown to be very important for the export of garments. This does not apply in every country case: the growth of the garment industry in such countries as Haiti, Jordan and Lesotho was indeed tied to preferential access awarded by large markets. As mentioned above, the direct impact of these bilateral trade agreements is not fully incorporated into this model. Another example is that natural capital is one of the top requirements in footwear assembly, likely because of the dominance in this sector of China, which has an abundance of natural capital used not in footwear but in other sectors.
|                        | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  |
|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Proximity to markets   | 0.56| 0.17| 0.28| -0.16| 0.36| 0.20| 0.54| 0.58| 0.39| 0.28| 0.54| 0.58| 0.52| 0.42|
| Natural capital        | 0.00| 0.39| 0.18| -0.09| 0.19| 0.42| 0.15| 0.11| 0.97| 0.23| 0.03| 0.10| 0.18| 0.16|
| Human capital          | 0.55| -0.57| -0.19| -0.17| 0.16| -0.18| 0.58| 0.62| 0.50| 0.49| 0.72| 0.62| 0.69| 0.57|
| Physical capital       | 0.32| -0.35| -0.04| -0.48| -0.13| -0.14| 0.65| 0.76| 0.16| 0.28| 0.69| 0.54| 0.88| 0.46|
| Institutional capital  | 0.51| -0.42| -0.06| -0.41| -0.10| -0.13| 0.62| 0.73| 0.34| 0.47| 0.76| 0.62| 0.86| 0.54|
| Logistics              | 0.67| -0.04| 0.15| -0.41| 0.19| 0.16| 0.82| 0.86| 0.74| 0.61| 0.98| 0.85| 0.92| 0.74|
| Wage competitiveness   | -0.17| 0.34| 0.08| 0.44| 0.13| 0.14| -0.47| -0.56| -0.05| -0.21| -0.50| -0.32| -0.64| -0.32|
| Market access          | 0.19| -0.46| -0.06| -0.63| 0.16| 0.20| 0.24| 0.33| 0.33| 0.22| 0.32| 0.30| 0.26| 0.25|
| Access to inputs       | 0.33| 0.20| 0.17| 0.20| 0.25| 0.31| 0.18| 0.34| 0.13| 0.11| 0.33| 0.29| 0.26| 0.19|

Source: Authors’ calculations

Legend:
1= Plastic / Rubber; 2= Hides, Skins;
3= Textiles; 4= Clothing;
5= Footwear – Intermediate; 6= Footwear- Final;
7= Stone / Glass; 8= Metals;
9= Machinery/Electronics – Final; 10= Machinery/Electronics – Intermediate;
11= Transport – Final; 12= Transport – Intermediate;
13= Miscellaneous– Final; 14= Miscellaneous– Intermediate
V. Application to Southern Africa

A. Context

Having established the capability requirements globally and within GVC sectors, we now turn to an application of this methodology to a region that has been largely on the periphery of global value chains: the Southern African Customs Union (SACU) countries, comprising South Africa, Botswana, Namibia, Lesotho and Swaziland. SACU countries rank far behind many other regions in total GVC exports. Table 7
shows the value of GVC exports for SACU and other regions like ASEAN, Eastern Europe, Mercosur and the East African Community. Even accounting for size, SACU lags: SACU countries export less than 3 percent of the value of GVC products that ASEAN exports, with a population that is roughly 10 percent of ASEAN and GDP that is 18 percent of ASEAN. Within SACU, South Africa accounts for about 92 percent of the region’s GVC exports.

**Table 7: Value of GVC Exports, 2012, by Region**

| Region                        | Value (in US$000s) |
|-------------------------------|--------------------|
| ASEAN                         | 492,000,000        |
| Eastern Europe                | 319,000,000        |
| Mercosur                      | 31,200,000         |
| South Africa                  | 11,200,000         |
| SACU (excl. South Africa)     | 985,222            |
| -Lesotho                      | 530,794            |
| -Swaziland                    | 229,695            |
| -Botswana                     | 137,418            |
| -Namibia                      | 87,315             |
| East African Community\(^{11}\) | 589,240            |

Source: Authors' calculations based on data from UN Comtrade

SACU countries have accumulated different levels of GVC-related capabilities (Table 8). In terms of human capital, as measured by the average years of schooling, Botswana and South Africa score high (at over eight years of schooling), while Namibia lags behind the other SACU countries (at six years). South Africa’s total natural capital valuation far outpaces other countries, with Botswana in a distant second. Botswana and South Africa have a substantial advantage on physical capital per capita. Having successfully managed revenues from resource extraction, Botswana’s institutions are rated ahead of the other countries, including South Africa, with Lesotho and Swaziland lagging behind the others in this area. All countries are in a similar geographic situation, relative to other markets. South Africa is a much more sophisticated logistical hub, however. South Africa, being a more industrialized country, has a higher minimum wage, in the context of higher productivity. In terms of market access and access to inputs, all countries are in a favorable position, with the exception of Swaziland on market access.

\(^{11}\) The East African Community (EAC) includes Burundi, Kenya, Rwanda, Uganda and Tanzania.
Table 8: Current Capability Levels, SACU Countries

| Ctry | Proximity to Markets | Nat. Capital | Human Capital | Phys. Capital | Inst. Capital | Logistics | Wage Comp. | Mkt Access | Access to Inputs |
|------|----------------------|--------------|---------------|---------------|---------------|-----------|------------|------------|------------------|
|      | GDP-weighted distance index (0-far to 1-near) | $ billion | Years of schooling | $US per capita | Rating from -2.5 to 2.5 | Rating 1 to 5 | Min. wage in $US | Index (0 to 1) | Index (0 to 1) |
| BWA  | 0.42 | 30 | 9.6 | 19.70 | 0.66 | 2.49 | 105.0 | 0.89 | 0.99 |
| LSO  | 0.38 | 2.5 | 6.6 | 3.98 | -0.30 | 2.37 | 104.1 | 0.90 | 0.96 |
| NAM  | 0.44 | 14 | 6.0 | 9.90 | 0.23 | 2.66 | -- | 0.91 | 0.99 |
| SWZ  | 0.40 | 13 | 7.6 | 4.61 | -0.50 | -- | 107.5 | 0.68 | 0.98 |
| ZAF  | 0.35 | 790 | 8.6 | 13.61 | 0.10 | 3.43 | 646.4 | 0.94 | 0.95 |

Source: See Table 1 for data sources

How do these underlying capabilities for SACU countries stack up globally? Figure 2 shows the standardized capability levels compared to a region of major importance in cross-border value chains, ASEAN. South Africa is analyzed separately from the rest of SACU given its size and level of industrialization. The figures are standardized so that capabilities can be compared to one another and read in terms of standard deviations from the average country. Then, the standardized figures are compared in the chart. A bar extending to the right of zero denotes an advantage relative to the ASEAN average and a bar extending to the left of zero denotes a deficit. South Africa has several advantages relative to ASEAN: logistics, institutional capital, natural capital, human capital, market access and access to inputs. South Africa lags behind ASEAN in physical capital per capita and wage competitiveness. Although Botswana, Namibia, Lesotho and Swaziland fare worse than ASEAN on most of the nine capabilities, they are not without some advantages: access to inputs, institutional capital and wages.

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12 Two measurements are missing in the original databases and these gaps were filled in the following way. Namibia’s wage competitiveness is assumed to be no better than Swaziland, and Swaziland’s logistics are assumed to be the same as Lesotho’s.

13 For a 19-year old worker or an apprentice.
B. How do SACU’s capabilities compare to requirements of GVC sectors?

Overlaying the global requirements of each GVC sector described previously and the capabilities present in SACU economies, Figure 3 depicts the alignment between SACU’s current endowments and the requirements in the largest sectors of GVC trade. The units of the axes are standard deviations from the average endowment. For simplicity, here we average SACU’s endowment across all five SACU countries, although we disaggregate countries in later analysis. The figure helps visualize where SACU’s capabilities fall short of what is required to produce in a sector. The gaps with respect to machinery/electronics and transport are especially apparent in long-term policy-dependent capabilities like human capital, physical capital, institutional capital but also logistics/connectivity (short-term policy variable) and proximity to markets (fixed characteristic). The total gap across all capabilities seems substantially higher in machinery/electronics and transportation as compared to clothing and textiles.
In order to quantify the total gap between current capabilities and what is required to export within a GVC sector, we create a “similarity index.” In Table 9, the lower the index score, the greater the similarity between existing and required capabilities. Sectors with a similarity index\(^{14}\) below two standard deviations are highlighted to show the sectors closely matching current capabilities. This threshold is artificial; there is no specific level of participation in GVCs implied by a given similarity score. All index figures are greater than zero, signifying some distance between the current endowment and requirement for the average

\(^{14}\) The index was constructed with two sets of weights: first, by the importance of a given capability in a sector; that is, if a capability is more important within a sector, the gap between what is available and what is required takes on greater importance. Second, in aggregating products within a sector, the products are weighted according to their trade value.
product in that sector. We construct the index so that an "excess" capability in one capability does not compensate for a deficiency in another capability.

All countries in SACU have current capabilities that are closer to sectors like ‘hides and skins’ and ‘clothing’ and further away from sectors like machinery and metals. South Africa has more sectors in its comfort zone, nine in total, and they include more technology-intensive sectors like machinery/electronics. Swaziland has none, while Lesotho, Namibia and Botswana have two, three and four, respectively.

In the case of South Africa, however, the hierarchy of sectors does not seem to fit reality, as the country participates robustly in machinery/electronics while its textiles and garment industry has declined in recent decades (Annex Table A4). First, the total capability requirement for hides/skins and clothing is lower, so the current capability bundle will naturally be a better match. The model also does not fully account for the competitive nature of the global marketplace in which major garment exporters like Bangladesh with relative capabilities far more aligned with garment sector requirements pull market share away from South Africa and other countries. Finally, the requirements are averages across the entire product category, so a gap implies only that South Africa’s capabilities differ from the average product in a sector.

Given the mix of capabilities available in the economy, countries will gain or lose sectors according to how well those sector requirements match their capabilities. In terms of what sectors are achievable, the “ladder” is roughly similar across SACU countries, implying that countries in SACU are on roughly similar development trajectories. The far right column shows the similarity scores for the United States, as an example to show the difference in sector scores between SACU countries and another economy. The results also tell a surprising story about the achievability of participating in final versus intermediate GVC export sectors. As we showed previously, intermediates generally tend to require a higher amount of capabilities. However, there is sector-level variation. This table shows intermediate exports of machinery/electronics are more achievable – that is, intermediates have a lower similarity index for SACU countries – than final products. Intermediate exports of footwear, however, are less achievable for most countries than final assembly.

Table 9: Similarity Index, Current Capabilities

| Sector                  | BWA | LSO | NAM | SWZ | ZAF | Memo: USA |
|-------------------------|-----|-----|-----|-----|-----|-----------|
| Hides, Skins            | 0.60| 0.99| 0.85| 2.71| 0.45| 0.10      |
| Clothing                | 0.71| 1.23| 0.84| 2.29| 0.74| 0.38      |
| Footwear- Final         | 1.81| 2.22| 1.79| 3.65| 1.33| 0.78      |
| Footwear - Intermediate | 1.73| 2.46| 2.06| 3.63| 1.43| 0.73      |
| Mach/Elec - Intermediate| 2.05| 3.38| 2.73| 4.51| 1.58| 0.40      |
| Textiles                | 2.08| 2.58| 1.97| 3.28| 1.70| 0.77      |
| Miscellaneous - Intermediate | 2.35| 3.73| 3.05| 4.85| 1.84| 0.36      |

15 It was not feasible to take all nine requirements relative to one another, but if we did so, we might be able to more accurately assess the capability requirements of major sectors.
| Category                  | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---------------------------|------|------|------|------|------|------|
| Plastic / Rubber          | 2.21 | 3.56 | 2.90 | 4.63 | 1.91 | 0.43 |
| Mach/Elec - Final         | 2.65 | 3.81 | 3.15 | 4.95 | 1.97 | 0.58 |
| Transport - Intermediate  | 2.58 | 3.98 | 3.28 | 5.10 | 2.07 | 0.32 |
| Stone / Glass             | 2.61 | 4.04 | 3.35 | 5.13 | 2.11 | 0.28 |
| Transport - Final         | 2.78 | 4.27 | 3.55 | 5.39 | 2.25 | 0.32 |
| Metals                    | 2.73 | 4.20 | 3.48 | 5.33 | 2.26 | 0.29 |
| Miscellaneous - Final     | 2.92 | 4.43 | 3.73 | 5.52 | 2.41 | 0.23 |

Source: Authors’ calculations
Note: Lower scores denote higher similarity. Table is sorted by South Africa (ZAF). Sectors within two standard deviations are highlighted, but this does not imply a certain level of participation in that sector.

C. How can policy reform extend GVC participation?

Since investments in capabilities over time can shift comparative advantage, we simulate the effects of improvements in the seven policy-dependent capabilities to illustrate the dynamic nature of sector targets. We first raise all short and long-term policy variables\(^{16}\) to the median (Table 10) and then to the 60\(^{th}\) percentile (Table 11). In the following simulation, if a country’s capabilities are currently lower than the proposed level, they were replaced; otherwise, they stay the same.

Country-level results need to be interpreted cautiously, as additional analysis would be required to draw any conclusions about the potential for participation in a specific GVC sector. The current simulation provides only directional results. For one, it cannot account for interplay between the capabilities. For example, if physical capital per capita increases, then labor costs will likely increase, productivity effects notwithstanding, but we do not attempt to predict the exact change in a country’s wages.

Not surprisingly, with greater capabilities, more sectors fall into the “comfort zone” of countries. Lesotho, for example, with capabilities at the median, can now participate to a greater extent in footwear – both final assembly and intermediate inputs. Botswana can participate in an additional four sectors. In fact, all four countries aside from South Africa now have the rough set of capabilities necessary for participation in hides/skins, clothing and footwear. Meanwhile, South Africa’s set of achievable sectors do not change from the current state. If all seven policy variables are raised to the 60\(^{th}\) percentile, an even greater number of sectors come into play. This suggests that there is substantial scope for policy to shape outcomes.

The results point to setting realistic goals for participation in global value chains, however. The transport sector, for example, remains out of reach for all SACU countries except for South Africa even at the 60\(^{th}\) percentile level of capabilities. Fixed characteristics will also inhibit participation in some sectors when they are important, but they can be overcome in certain cases. Proximity to markets, for example, is important in textiles, and this may restrict SACU countries’ participation in this sector even with enhanced capabilities.

\(^{16}\) The seven policy variables are: human capital, physical capital, institutional capital, logistics/connectivity, wage competitiveness, market access and access to inputs.
Table 10: Similarity Index with All Seven Policy Variables Raised to Median

| Sector                             | BWA | LSO | NAM | SWZ | ZAF |
|------------------------------------|-----|-----|-----|-----|-----|
| 41-43 Hides, Skins                | 0.38| 0.52| 0.46| 0.50| 0.45|
| 61-63 Clothing                     | 0.52| 0.61| 0.48| 0.57| 0.74|
| 64-67 Footwear- Final             | 1.50| 1.69| 1.50| 1.64| 1.33|
| 64-67 Footwear - Intermediate     | 1.44| 1.66| 1.45| 1.61| 1.43|
| 84-85 Mach/Elec - Intermediate    | 1.71| 2.47| 2.05| 2.43| 1.57|
| 50-60 Textiles                    | 1.77| 2.03| 1.76| 1.97| 1.70|
| 90-97 Miscellaneous - Intermediate| 1.99| 2.80| 2.38| 2.76| 1.84|
| 39-40 Plastic / Rubber            | 1.88| 2.67| 2.24| 2.63| 1.90|
| 84-85 Mach/Elec - Final           | 2.27| 2.90| 2.52| 2.86| 1.96|
| 86-89 Transport - Intermediate    | 2.20| 3.04| 2.62| 3.00| 2.06|
| 68-71 Stone / Glass               | 2.26| 3.12| 2.69| 3.08| 2.10|
| 86-89 Transport - Final           | 2.38| 3.30| 2.87| 3.26| 2.25|
| 72-83 Metals                      | 2.34| 3.26| 2.83| 3.22| 2.25|
| 90-97 Miscellaneous - Final       | 2.57| 3.50| 3.07| 3.47| 2.41|

Source: Authors’ calculations

Table 11: Similarity Index with All Seven Policy Variables Raised to 60th Percentile

| Sector                             | BWA | LSO | NAM | SWZ | ZAF |
|------------------------------------|-----|-----|-----|-----|-----|
| 41-43 Hides, Skins                | 0.29| 0.33| 0.27| 0.31| 0.40|
| 61-63 Clothing                     | 0.52| 0.61| 0.48| 0.57| 0.74|
| 64-67 Footwear- Final             | 1.32| 1.44| 1.29| 1.39| 1.31|
| 84-85 Mach/Elec - Intermediate    | 1.51| 1.84| 1.60| 1.80| 1.34|
| 64-67 Footwear - Intermediate     | 1.26| 1.39| 1.22| 1.34| 1.39|
| 90-97 Miscellaneous - Intermediate| 1.79| 2.17| 1.92| 2.13| 1.61|
| 39-40 Plastic / Rubber            | 1.69| 2.05| 1.80| 2.01| 1.68|
| 50-60 Textiles                    | 1.56| 1.72| 1.51| 1.65| 1.68|
| 84-85 Mach/Elec - Final           | 2.08| 2.33| 2.10| 2.28| 1.75|
| 86-89 Transport - Intermediate    | 2.00| 2.43| 2.17| 2.38| 1.84|
| 68-71 Stone / Glass               | 2.06| 2.49| 2.24| 2.44| 1.87|
| 86-89 Transport - Final           | 2.18| 2.67| 2.42| 2.62| 2.02|
| 72-83 Metals                      | 2.15| 2.63| 2.38| 2.59| 2.02|
| 90-97 Miscellaneous - Final       | 2.37| 2.87| 2.61| 2.82| 2.17|

Source: Authors’ calculations

VI. Conclusion

This paper traces performance in GVC sectors to underlying capabilities that are required to participate in a sector, which, in the context of this study, means exporting a set of GVC-related products. The revealed
factor intensity methodology puts emphasis on the underlying capabilities required for participation in global value chains and, importantly, shows how the requirements differ by sector.

Although fixed structural factors play a role in supporting or inhibiting GVC participation, there exists substantial scope for policy to shape outcomes. Policy reforms include investments in capabilities that change over a long time horizon, like physical, human and institutional capital, as well as variables that can be affected over a shorter time horizon, like logistics/connectivity, wage competitiveness, market access and access to inputs. Through policy reforms, countries can remove or counteract some of the deficiencies that have thus far left them out of production networks. Improving capabilities can lead to increasing participation in more technology-intensive manufacturing sectors.

Overall, logistics, proximity to markets and strength of institutions seem to be most important for GVC participation. Low labor costs, meanwhile, appear to be relevant only for final assembly stages of GVCs, and then only as part of a package of characteristics that may bring about GVC participation.

Setting realistic goals for GVC participation in the future is important. There exists a sector “ladder” of increasingly greater levels of capability requirements. The ladder is not identical across all countries worldwide. Overall, by looking at the capability intensity of different industries, and which capabilities can be changed over what timeframe, policy makers can make decisions on which GVC products and sectors where they are likely to have the greatest potential to compete and which capabilities to invest in. It is not always the case that intermediates are less achievable than final assembly.

The SACU region may be structurally disadvantaged by being far from global markets, but other policy-related variables may matter just as much. Therefore, if SACU countries want to increase their participation in GVCs, they need to focus on addressing existing policy gaps that restrict global value chain participation. Other studies have described what specific policies might be beneficial, consistent with the findings of this study. These include, among others: addressing gaps in regional trade facilitation and trade policy to improve access to markets, and lower the cost of access to inputs; improving access to and quality of key services inputs; and, raising skills to improve productivity in order to exploit regional wage competitiveness (World Bank, 2016). Initially, these investments can contribute to participation in lower value-added segments in GVCs, and over the long-term can lead to greater participation in more technology-intensive and higher value-added activities and sectors.

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### Annex

**Table A1. Indicators Used to Represent GVC-Related Capabilities**

| Concept                   | Indicator (and unit)                                                                 | Source                                                                 | Year  | # Countries |
|---------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------|-------------|
| Proximity to markets     | GDP-weighted distance (inverted)                                                     | CEPII                                                                  | 2011  | 224         |
| Natural capital          | Total value of natural capital in US$                                                 | World Bank Wealth of Nations                                          | 2010  | 205         |
| Human capital            | Average years of schooling (>15 years old population)                                | Barro and Lee (2010)                                                  | 2010  | 146         |
| Physical capital         | Capital stock per person                                                              | World Bank World Development Indicators and staff calculations        | 2010  | 138         |
| Institutional capital    | Rule of Law                                                                           | Worldwide Governance Indicators (Kauffman, Kraay and Mastruzzi)       | 2013  | 212         |
| Logistics/Connectivity   | Logistics Performance Index (International LPI)                                       | World Bank                                                            | 2014  | 160         |
| Wages                    | Minimum wage for a 19-year old worker or an apprentice                                | World Bank, Doing Business Annex (Employing Workers)                  | 2014  | 153         |
| Market Access            | Overall Trade Restrictiveness Index (of Trading Partners)                            | World Bank Overall Trade Restrictiveness Indices                      | 2009  | 167         |
| Access to Inputs         | Overall Trade Restrictiveness Index (OTRI)                                            | World Bank Overall Trade Restrictiveness Indices                      | 2009  | 105*        |
Table A2: Correlation between Capabilities

Fixed capabilities:

|                        | Proximity to Markets | Natural Capital |
|------------------------|----------------------|-----------------|
| Proximity to Markets   | 1.0000               |                 |
| Natural Capital        | 0.0174               | 1.0000          |

Long-term Policy Variables:

|                        | Human Capital | Physical Capital | Institutional Capital |
|------------------------|---------------|------------------|-----------------------|
| Human Capital          | 1.0000        |                  |                       |
| Physical Capital       | 0.5946        | 1.0000           |                       |
| Institutional Capital  | 0.6529        | 0.8246           | 1.0000                |

Short-term Policy Variables:

|                        | Logistics/Connectivity | Wage Competitiveness | Market Access | Access to Inputs |
|------------------------|------------------------|----------------------|---------------|------------------|
| Logistics/Connectivity | 1.0000                 |                      |               |                  |
| Wage Competitiveness   | -0.7133                | 1.0000               |               |                  |
| Market Access          | 0.2419                 | -0.1666              | 1.0000        |                  |
| Access to Inputs       | 0.2448                 | -0.2304              | -0.0192       | 1.0000           |

Source: Authors’ calculations

Table A3: Value and Intensity of Global GVC Trade by Sector, 2012

| HS Category                | GVC Trade (US$ million) | Percent of GVC Trade by Value (Global) | GVC Intensity: GVC Trade/Total Trade |
|----------------------------|-------------------------|---------------------------------------|--------------------------------------|
| 84-85 Machinery/Electronics| 3,340,000               | 60.5%                                 | 78%                                  |
| 86-89 Transport            | 1,090,000               | 19.7%                                 | 73%                                  |
| 61-63 Clothing             | 357,000                 | 6.5%                                  | 88%                                  |
| 90-97 Misc. Manufactures   | 355,000                 | 6.4%                                  | 38%                                  |
| 50-60 Textiles             | 130,000                 | 2.4%                                  | 57%                                  |
| 64-67 Footwear             | 116,000                 | 2.1%                                  | 93%                                  |
| 72-83 Metals               | 52,000                  | 0.9%                                  | 4%                                   |
| 39-40 Plastic / Rubber     | 46,600                  | 0.8%                                  | 6%                                   |
| 68-71 Stone / Glass        | 13,500                  | 0.2%                                  | 2%                                   |
Table A4: Value of SACU Countries’ GVC Exports by Sector, 2012, in US$ thousands

| Sector               | BWA   | LSO    | NAM   | SWZ    | ZAF    |
|----------------------|-------|--------|-------|--------|--------|
| Transportation - Final | 28,167 | 2,470  | 3,437 | 2,489  | 4,444,976 |
| Mach/Elec - Intermediate | 75,513 | 76,390 | 60,093 | 32,459 | 3,788,681 |
| Transportation - Intermediate | 6,435  | 271    | 4,409 | 989    | 1,169,907 |
| Clothing             | 21,213 | 392,012 | 4,672 | 164,132 | 352,932 |
| Mach/Elec - Final    | 1,803  | 16,844 | 4,132 | 508    | 338,996  |
| Miscellaneous - Intermediate | 471    | 76     | 5,532 | 6,574  | 257,247  |
| Miscellaneous - Final | 409    | 70     | 908   | 8,406  | 190,398  |
| Metals               | 572    | 16     | 1,942 | 2,317  | 174,848  |
| Footwear- Final      | 544    | 31,360 | 408   | 81     | 153,343  |
| Plastic / Rubber     | 223    | 3      | 877   | 1,817  | 112,716  |
| Textiles             | 1,041  | 11,093 | 737   | 9,700  | 97,671   |
| Hides, Skins         | 26     | 0      | 21    | 5      | 76,532   |
| Stone / Glass        | 583    | 16     | 127   | 164    | 49,991   |
| Footwear - Intermediate | 240    | 165    | 6     | 0      | 9,027    |

Source: Authors’ calculations based on data from UN Comtrade