

The Potential of Financial Services and Private Sector in Accelerating Export Diversification in Africa

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Abstract

This paper uses various macro-level and firm-level datasets for the period 2000–2020 to examine the potential role of financial services and the private sector in promoting economic diversification in Africa. Although financial development has previously been explored as a significant driver of export diversification, recent literature emphasises the importance of governance and institutional frameworks as prerequisites to export diversification. This research contributes to this emerging body of literature by investigating the interactive effects of financial development, property rights protection, and rule-based governance in promoting export diversification in Africa. The paper uses robust dynamic panel estimation techniques. The primary results of the study show financial development and the private sector are independent drivers of export diversification. Using FinTech as an alternative measure of financial development, the results further show that it leads to more specialization in their export baskets, resulting in a greater degree of export concentration. However, FinTech is only able to enhance export diversification when there is a strong degree of property rights protection and rule-based governance. In terms of specific financial services, the results show greater diversification with insurance rather than banking services. On the firm level, we find that access to credit lines or loans from financial institutions, access to an internationally recognised quality certification, and greater private foreign stake in a firm's ownership positively influences a firm's decision to export as well as improve their export volume. Larger entities, compared to SMEs, are more predisposed to export, demonstrating also a greater contribution to intensive margin of exports relative to SMEs. This finding underpins the need for increased access to long-term finance for SMEs to drive the diversification agenda, especially because they account for approximately 90% of businesses in Africa. Finally, our descriptive analysis suggests that a move towards export diversification is likely to be associated with economic transformation.

The findings, interpretations and conclusions expressed herein are those of the author and do not necessarily reflect the views of the UNCTAD secretariat or its member States. The designations employed and the presentation of material do not imply the expression of any opinion on the part of the United Nations concerning the legal status of any country, territory, city or area, or of authorities, or concerning the delimitation of its frontiers or boundaries. This paper has not been formally edited.

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1 Introduction

African economies are generally commodity-dependent, with revenues being highly volatile due to the price boom and bust nature of the market. For some time now, the general policy prescription to deal with that has been for the countries to use their export earnings to engineer structural transformation that will lead to the diversification of the economies (see, for example, Ghosh and Ostry, 1994; Bleaney and Greenaway, 2001; McMillan, Rodrik and Verduzco-Gallo, 2014). As plausible as this policy suggestion is, its implementation is fraught with several political economy issues. Accordingly, the African Continental Free Trade Area (AfCFTA) was recently founded to boost intra-African trade and encourage industrial development through export diversification and regional value chain development. However, its efficiency in fulfilling this role lies in the accompanying export policies and strategies, as well as the ability of African countries to leverage the accorded opportunities for export diversification, industrialisation, and supply chain development. This requires a deeper understanding of the idiosyncratic issues that underpin export diversification, and that is what this paper seeks to achieve. In this paper, we build on Nieminen (2020) by focusing on the drivers of export diversification, but identifying the key factors robustly associated with export diversification from a much larger set of potential drivers, as well as considering interactive effects between some of the key drivers. Another novel contribution of this paper is the introduction of FinTech (proxied by mobile money access), another important measure of financial development yet to be explored in the literature as a potential determinant of export diversification in Africa.

Investigating factors that affect diversification, Agoshi *et al.* (2011) find that trade openness encourages higher specialisation, financial development does not lead to export diversification and exchange rates volatility has a negative effect on export diversification. Human capital accumulation likewise improvements in terms of trade positively impacts export diversification, with the latter helping to intensify and increase existing export structures. Using cross-country regression analysis, Nieminen (2020) discovers that access to domestic financial services enhances export diversification by boosting the number of small exporters, as financial services alleviate credit limitations faced by these exporters. Agreeing with Nieminen (2020), Fosu and Abass (2019) use system GMM estimations to produce strong evidence supporting the relevance of domestic credit in African countries, while its role appears to be minimal in other countries. Furthermore, human capital in the form of education, governance as assessed by constraints on the chief executive of government and being landlocked all have major effects on African countries' export diversification, as expected. These findings are re-echoed by Giri *et al.* (2019), who use Bayesian Model Averaging (BMA) to determine policy measures that are required to improve export diversification. According to their findings, policymakers should prioritise human capital accumulation and lower trade barriers in order to diversify. Improving the quality of institutions and growing the financial sector are two additional policy areas. For commodity exporters, reduction of trade barriers is the most important driver of diversification, closely followed by a strong human capital base and robust financial sector. Very recently, Alfaki and El Anshasy (2022) also found that bank credit is a significant factor in their study of diversification in the United Arab Emirates. There appears to be a clear indication in the literature concerning the important role financial systems can potentially play in the export diversification drive, however, its interactive effects with other key determinants are understudied and remain less established.

Another strand of literature also looks at the implications of having a diversified export portfolio. The principle of export diversification appears to contradict the benefits of specialisation driven by

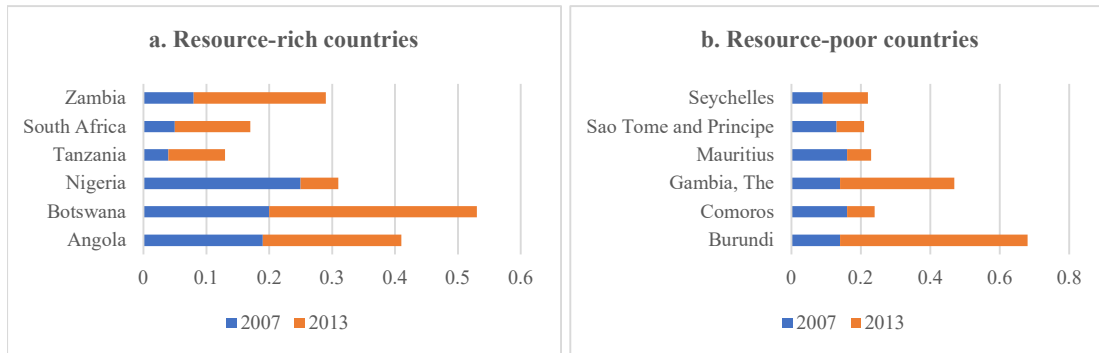
comparative advantage, which is the foundation of trade theory (Giri et al. 2019). Diversification appears to contradict the benefits of specialisation driven by comparative advantage, which is the foundation of trade theory. However, increased trade openness and specialisation expose economies to sector-specific external adverse shocks that may be hard to insure against. Some of the benefits of diversification identified in the literature include its resilience to macroeconomic instability (IMF, 2014; Haddad *et al.*, 2013; and Koren and Tenreyro, 2007) which aids economic growth. IMF (2014; 2017) reports advocate for diversification, contending that diversification of exports and output is fundamental to economic growth, especially in commodity-exporting countries. Although it is often argued that growth can be associated with diversification (Acemoglu, 1997; Reiner, 2008), there is evidence that such a relationship is non-monotonic where it exists, or the reverse is the case. Part of the argument is that the relationship can be positive at low levels of development, but beyond certain thresholds of development, the production becomes concentrated (Imbs and Wacziarg, 2003). Cadot *et al.* (2011) argue that such does not only hold for production and income but also export and income. Similarly, Klinger and Lederman (2004, 2006) discovered that exports diversify and subsequently reconcentrate as income increases. On one hand, the function of export diversification in low-income countries, namely stabilisation of the macroeconomic environment; improvement of the business environment, including access to finance; and investment in human capital and infrastructure, are all underpinned by rising income levels. On the other hand, Caballero and Cowan (2008) show that as countries diversify and prosper, they become more integrated in the global economy, allowing them to reconcentrate in a certain set of goods, fulfilling the trade gains that come from comparative advantage. This is why most mineral product exporters are either low-income countries or very high-income ones. Unsurprisingly, Cadot et al (2011) also found the share of raw materials to be a significant contributor to export concentration.

Given that most African countries are endowed in natural resources, the literature on export diversification in resource-rich countries, although scanty, is particularly relevant for this paper. Countries that possess a relative wealth of natural resources will specialise in their export basket under a classic Heckscher-Ohlin model, although whether this will translate into diversification is theoretically unclear (Ross, 2019). The Prebisch-Singer hypothesis postulates that low-income countries that concentrated their commodity exports risked deteriorating terms of trade and were highly improbable to diversify (Singer, 1950; Prebisch, 1949), in contrast to the staple theory of growth, which posits that when resource booms take place in low-income regions, they attract labour and capital, and boost investment in local value-added industries, resulting in diversification of the export portfolio (Innis, 1956; Watkins, 1963). According to relatively recent theoretical models, specialisation in mineral resources, particularly oil, may constitute a barrier to export diversification. The Dutch Disease, in which a surge in natural resource exports leads to currency appreciation and a loss of competitiveness in other tradable industries, is the most frequently stated reason (Corden and Neary, 1982). This means that a major resource discovery will increase resource reliance via both a direct and indirect mechanism: an increase in the value of resource exports and a fall in the value of non-resource exports respectively. The empirical evidence on the importance of the Dutch Disease effect is well established: for every additional \$1 in resource earnings, countries suffer a 75 cent drop in non-resource exports (Harding and Venables, 2016). This is why the export structure of resource-rich¹ sub-Saharan African countries

¹ This is based on the definitions in the World Bank 2018, *Changing Wealth of Nations*, to calculate natural resources per capita and rank countries. Natural capital is the sum of crops, pastureland, timber, non-timber forest, protected areas,

is more concentrated on average than that of resource-poor African countries (Izvorski, Coulibaly & Doumbia, 2018).

Figure 1 Export Concentration in Resource-Rich SSA Countries versus Resource-Poor SSA (2007-2013)



Source: TCDData360; *Note:* Export Concentration is measured by The Herfindahl-Hirschman index which is based on the concentration of exports across products in terms of the importance of exported goods in aggregate exports. Although data extends to 2015, it is only up to 2013 that there is comparable data for these countries.

The literature – both theoretical and empirical – has shown that achieving export diversification in Africa is complex even for resource-rich African countries. This is why this paper sets out to address various but related questions about diversification and the role of the factors identified in the literature in transiting African economies into more diversified ones. These questions are: (1) What are the interrelationships between macro-level export diversification, financial development and private sector development? (2) Can FinTech growth in Africa help the continent diversify its export structure? (3) Does the protection of private property rights and rule-based governance play a moderating role in the financial development and export diversification nexus? (4) What are the differential effects of the various financial services on export diversification in Africa? (5) What is the relationship between export-sector firm dynamics and macrolevel export diversification? (6) What are the drivers of extensive and intensive margins of export of firms in Africa? (7) Can export diversification translate into economic transformation in Africa?

The remainder of the paper is structured as follows. Section 2 provides an overview of the data used and section 3 discusses the methodology and estimation strategy while Section 4 discusses the results. Section 5 concludes and discusses policy implications derived from the results.

2 Data

Data for this study are collated from various sources. For the first part of the paper where we look at the interrelationships between financial sector development, private sector development and

cropland, pastureland, oil, natural salt, coal, and minerals. Natural capital per capita is calculated using the natural capital in the database divided by population. The GDP-weighted values use GDP PPP, 2011 international dollars (Izvorski, Coulibaly & Doumbia, 2018: 8). It is also consistent with the IMF's definition of a country as a resource-rich country if at least 20% of its exports or fiscal revenue is from non-oil renewable natural resources (IMF, 2012).

export diversification, we draw data from the World Bank World Development Indicators, IMF Financial Sector Development Databases and Export Diversification Database, and World Bank Export Dynamics Database. The analysis covers the years 2000–2014 in an unbalanced panel due to irregular reporting from several countries. Table A1 describes all variables used and their data sources. Summary statistics of these variables are provided in Table 1a and a correlation matrix is provided in Table A3 in the Appendix.

For the second part of the paper, we made use of the World Bank Enterprise Surveys. However, it is worth noting that throughout the years 2000–2020, the surveys only covered 45 African countries². Thus, this study's scope includes these 45 African countries for which a survey was conducted between 2006 and 2016. Table A2 presents a thorough overview of all variables used for this part and their data sources. Summary statistics of these variables are also provided in Table 1b, and a correlation matrix in Table A4 in the Appendix.

2.1 Dependent variable

The main outcome variables for this study include macro-level export concentration, which is measured by the Theil's entropy index³, as well as measures of firm-level export concentration (intensive and extensive margin of exports⁴). The Export Diversification Database (IMF), which contains the Theil overall index of export concentration as well as the between and within components of the index, provides data on macrolevel export concentration. The higher the value of the index, the higher the degree of export concentration. In other words, the lower the index the greater the export diversification. The index is based on bilateral trade flow data with 851 product categories at the 4-digit SITC (Rev. 1) level (Nieminem, 2020; International Monetary Fund, 2014). Cadot *et al.* (2011a) demonstrate that the Theil index of export concentration may be additively split between and within components. Cadot *et al.* (2011a) show that the Theil index of export concentration can be decomposed additively into between and within components. Changes in the former reflect proportional changes in the number of active trade lines (i.e., variation in the number of new products exported or in the number of new markets for existing exports), while changes within the component of export concentration are indicative of variations in the concentration among active trade lines. The firm-level intensive and extensive margins are extracted from the World Bank Enterprise Surveys.

2.2 Explanatory variables

The following control variables are used for the cross-country panel data regressions as we found them to be widely used in the literature:

² Angola (2006, 2010), Botswana (2006, 2010), Burkina Faso (2009), Cameroon, Congo (2009), (2009, 2016), Ivory Coast (2009, 2016), Democratic Republic of Congo (2006, 2010, 2013), Egypt (2013), Ethiopia (2011), Ethiopia (2015), Gambia (2006), Ghana (2007, 2013), Guinea (2006, 2016), Kenya (2007, 2013), Lesotho (2016), Madagascar (2009, 2013), Malawi (2014), Mali (2007, 2010, 2016), Mauritania (2006, 2014), Mauritius (2009), Morocco (2013), Mozambique (2007), Namibia (2006, 2014), Nigeria (2007, 2014), Rwanda (2006), Senegal (2007, 2014), South Africa (2007, 2014), Sudan (2014), Swaziland (2006, 2016), Tanzania (2006, 2013), Tunisia (2013), Uganda (2006, 2013), Zambia (2007, 2013) and Zimbabwe (2016).

³ The index is “inversely related to the degree of diversification: it is zero if exports are equally distributed among n export lines (i.e. perfect diversification) and it achieves its maximum value, and if all exports is concentrated in one export line, while the export in other lines is equal to 0 (i.e. perfect concentration)” (Balavac, 2012:4)

⁴ Extensive margin = probability of assuming export status; Intensive margin = export volume

- i. Financial development index – The depth of financial institutions, access to financial institutions, the efficiency of financial institutions, the depth of financial markets, access to financial markets, and the efficiency of financial markets are all included in the financial development index (see Svirydzenka 2016 for more details on its computation). The higher the index the greater the country's financial sector development.

Theoretically, as the overall financial sector develops, firms' access to credit also improves, strengthening their ability to increase their share of manufacturing relative to primary export, leading to greater export diversification. This theoretical prediction is in line with Acemoglu and Zilibotti (1997) and DeRosa (1992), although it's worth noting that other scholars such as Saint-Paul (1992) and Jaud et al. (2012) have demonstrated that financial development can push countries to specialise based on their competitive advantage, resulting in a greater degree of export concentration. Given these mixed results, it is important to further examine the financial development-export diversification nexus in the African context.

- ii. Property rights and rule-based governance rating – Assesses the degree to which private economic activity is facilitated by an effective legal system and rule-based governance structure in which property and contract rights are reliably respected and enforced. Thus, this indicator was selected to be our proxy for private sector development. On a rating of 1–6, 1 indicates the lowest level of private sector development, with 6 indicating the highest level.

As noted by Nunn and Trefler (2014), domestic institutions can have a significant impact on foreign trade by serving as a source of competitive advantage and affecting factor accumulation and technological innovation. Similarly, Araujo et al. (2016) also show that in a setting with incomplete information, contract enforcement can affect firm export dynamics by limiting opportunistic behaviour. This finding is also supported by Beck (2003) and Manova (2013, 2018). Thus, not controlling for its effect in this study is likely to bias the regression estimates.

- iii. Access to electricity (as % of the population) – We use access to electricity as one measure of infrastructural development. Access to electricity is defined as the percentage of the population with access to electricity.

UNCTAD (2005) classifies infrastructure into two distinct forms: broad and narrow. The broad category includes electricity access, access to clean water and transportation. The narrow category encompasses access to personal computers, telephone lines and mobile phones. The variable, electricity access, therefore, represents the broad form of infrastructure. Electricity, like other utilities, is a necessary input in the operations of most businesses. It is one of the foundational services in the manufacturing of commodities, and so has an impact on projects aimed at increasing and diversifying exports. Efficiency in these services is critical to lowering transaction costs and increasing export competitiveness. Electricity access is therefore expected to have a positive relationship with export diversification.

- iv. Current health expenditure (as % of GDP) – This is the level of current health expenditure expressed as a percentage of GDP. Its estimate includes healthcare goods and services consumed during each year but excludes capital health expenditures such as buildings, machinery, IT and stocks of vaccines for emergencies or outbreaks. This indicator also captures the extent of the provision of health services in a given country.

Rodriguez (1998) finds that longer-term factors enabling export diversification include a well-educated workforce with high health and living standards. We, therefore, control for a healthy workforce using current health expenditure as a % of GDP, expecting it to be positively associated with export diversification in our study.

- v. School enrolment, secondary (% gross) – The gross enrolment ratio is the proportion of total enrolment, regardless of age, to the population of the age group that corresponds to the educational level shown. Secondary education completes the primary-level provision of basic education and strives to create the basis for lifelong learning and human development by providing more subject- or skill-oriented training from more specialised teachers.

The choice of human capital, as measured by school enrolment – secondary (% gross), is influenced by Rodriguez (1998). Agosin et al (2012) also find that human capital accumulation contributes significantly to export diversification. This finding is also shared by authors such as Jetter and Ramírez Hassan (2015); Cabral and Veiga (2010); and Murphy-Braynen (2019). We, therefore, expect to find a positive relationship between school enrolment, secondary (% gross) and export diversification in Africa.

- vi. Official exchange rate (LCU per US\$, period average) – Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar).

Agosin et al (2012) find exchange rate volatility to be a significant barrier to export diversification. Rodrik (2008), on the other hand, discovered evidence that an undervalued currency can promote export diversification when a country's institutional structure is weak. When distinguishing between the variety and concentration dimensions of export diversification, Goya (2014) discovers that the variety dimension of export diversification is positively associated with a weaker exchange rate and negatively related to exchange rate volatility. These associations appear to be stronger for commodities with a higher level of technological rigour. There is however no clear relationship between the exchange rate and export diversification. Based on the literature the link between exchange rate and export diversification (concentration) is far from conclusive, and thus must be further examined in the African setting.

- vii. GDP growth (annual %) – This is the yearly percentage growth rate of GDP at market prices based on constant local currency. Aggregates are calculated using constant 2015 prices expressed in US dollars. GDP is calculated as the sum of the gross value added by all resident producers in the economy, plus any product taxes and minus any subsidies not included in the product value. It is computed without taking into consideration depreciation of fabricated assets or depletion and degradation of natural resources.

Most of the literature on GDP growth rate and export diversification has tended to focus on the direction from export diversification to economic growth, commonly measured by GDP growth rate (Agosin et al. 2012; Hesse, 2009; Al-Marhubi, 2000; Bebczuk and Berrettoni, 2006). However, it would be interesting to empirically check if the direction of the relationship also runs from economic growth to export diversification. High levels of economic growth can incentivise the entry of export firms, which can translate into greater export diversification at the aggregate level. It is therefore important to empirically test this theoretical prediction.

- viii. Gross fixed capital formation – This represents another measure of infrastructural development and in some cases used as a proxy for private sector development. Land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings are all included in gross fixed capital formation (formerly gross domestic fixed investment).

It is widely acknowledged in the literature that infrastructural development within an economy is strongly associated with extensive margin of export diversification (Giri and Quayyum, 2019). Given the multifaceted definition of infrastructural development as noted earlier (UNCTAD, 2005), several studies have found and used gross fixed capital formation to measure this broad concept of infrastructural investment (Agosin 2008; Swathi and Sridharan, 2022; Meyer and Sanusi, 2019). The literature also points to a positive link between gross fixed capital formation and export diversification (Agosin, 2008; Tadesse and Shukralla, 2011).

In terms of the firm-level export diversification cross-sectional regressions, we use the following control variables in line with Regis (2018):

- i. whether establishment has access to a line of credit or loan – this is the variable of interest, measuring an establishment's
- ii. % of enterprises owned by private domestic individuals, companies or organisations
- iii. % of enterprises owned by private foreign individuals, companies or organisations
- iv. % of enterprises owned by government/state
- v. whether establishment has an internationally recognised quality certification or not?
- vi. size of firm – measured by total number of full time employees, adjusted for temporary workers
- vii. age of firm – calculated from when establishment started operations
- viii. gender of establishment's manager
- ix. does establishment presently have access to an overdraft facility
- x. whether establishment is a small and medium enterprise (sme) or large entity – based on number of employees (<100 employees classified as sme)

Summary statistics of these variables are presented in the Appendix.

3 Methodology

In the first part of the paper, we examine whether significant differences in the macrostructure of the export sector across African countries are related to cross-country variation in multidimensional financial development (and its interaction with private sector development) over the past two decades (2000–2020) and how these differences affect export diversification at the macro level. Our proposed empirical methodology follows (with some modifications)⁵ from Fernandes et al. (2016):

$$\text{ExportMeasure}_{it} = \alpha + \varphi\text{FD}_{it} + \delta\text{PSD}_{it} + \omega(\text{FD} * \text{PSD})_{it} + \eta X_{it} + \epsilon_{it} \quad (1)$$

where *ExportMeasure* measures macro-level export concentration; α is a constant; *PSD* captures private sector development indicated by the degree of protection of private property rights and rule-based governance; *FD* measures multidimensional financial sector development⁶; *X* is a vector of control variables including GDP annual growth rate, exchange rate, human capital, government health expenditure as a % of GDP, measures of infrastructure development such as gross fixed capital formation and electricity access; and ϵ is the error term. Institutions are known as “the rules of the game” (North, 1990) or the human environment (Dunning, 2006) that influence market participation, thus was incorporated in equation (1) to capture its moderating role of in the finance-export diversification nexus. Our measure of institutions, degree of protection of private property rights and rule-based governance, also serves as proxy for private sector development.

Along with the baseline pooled cross-sectional Ordinary Least Squares (OLS) regressions, we also run Arellano–Bond (AB) dynamic panel-data estimations because OLS regression estimates can be biased and inconsistent due to reverse causality between the measures of exports and the covariates as well as time-invariant country characteristics. A dynamic panel-data model is based on the assumption that the current behaviour of the regressors is influenced by the past one. The Arellano–Bond GMM estimator is preferred here because: (i) the panel dataset used has a relatively short time dimension and a large country dimension (Roodman, 2006); (ii) causality may run in both directions – from financial development to export diversification and vice versa – the regressors may be correlated with the error term. The AB GMM estimator removes any time-invariant country characteristics (fixed effects) that may be correlated with the explanatory variables and is also designed for situations with heteroskedasticity and autocorrelation within individual units’ errors, but not across them.

Next, we re-estimate equation (1) using the two estimators noted above but replace the financial development index with a measure of FinTech, access to mobile money, which we find in the literature to be a strong enabler of digital financial development (see Kanga et al., 2021; Makina, 2019).

⁵ We use country-year level (instead of firm-level) data on exporter diversification, using only macro-level explanatory variables. Given the aim of the paper, we strict our sample to only African countries, unlike Fernandes et al (2016) whose sample comprise developing countries. We also introduce an interaction term to capture the joint effects of financial development and private sector development on export diversification.

⁶ See the IMF Financial Development Index Database

We also explore which components of the financial sector appear to be spurring export diversification. For this purpose, we use bank credit to bank deposit (%)⁷ as a measure of banking sector development and insurance premium volume (% of GDP)⁸ for the insurance sector. Due to the lack of consistent data for stock market development, we only use the above two indicators.

In the next part of the analysis, we turn our focus to the relationship between firm-level dynamics and export diversification. The lack of consistent data on export-sector firm over the period under consideration has resulted in a more descriptive-analytic approach for this section.

In the penultimate section, we delve into another important topic – extensive and intensive margins of exports of firms in Africa. Here, we seek to present evidence on the determinants of margins of trade (intensive and extensive margins), while more importantly highlighting the role played by access to finance. We base our model on the heterogeneous firm theoretical models, where firm-level variations in intensive and extensive margins are explained by factors such as access to finance, firm size (number of employees), age of firm, public/private ownership structure, gender of manager of firm and whether firm is an SME or large entity. Our central hypothesis here is that access to finance increases the likelihood of exporting (extensive margin) and higher export volume (intensive margin). One of the contentious issues in the finance literature is endogeneity. In this instance, the study is concerned about the issue of the direction of causality between access to finance and trade margins. It is possible that firms that export and/or have higher export volumes are more likely to have access to finance. The presence of the likely bidirectional causality between the two variables – as also captured in the literature – points to the possible problem of endogeneity and simultaneity bias that may yield misleading results. Instrumental variable (IV) regressions were thus employed to minimise these issues. Although we acknowledge that IV does not fully address biases caused by omitted variables and unobserved firm-specific effects, it is nonetheless less susceptible to these biases.

We acknowledge that the IV estimator requires valid and strong instruments to produce unbiased coefficients. Taking a three-year lag of the annual sales and using approximate value of collateral needed as a % of loan value or line of credit statistically prove to be strong and valid instruments. Theoretically, past sales can be a strong predictor of a firm's ability to access credit. Using lagged sales means causality now can only run from the right-hand side to the left-hand of the equation, thus minimising endogeneity. Similarly, the value of collateral required to access a loan can be viewed as a strong predictor of successful application. The higher the value of the firm's collateral the more likely they are to be successful in accessing the loan. On the other hand, the value of a firm's collateral has no bearing on the firm's export volumes except through enabling the firm to obtain finance.

Since our data – extracted from the World Bank enterprise surveys – for this section is cross-sectional in nature, a comparison can be made between firms that have benefited from lines of credit or loans and those that have not. Our empirical model can be given as follows:

⁷ Bank credit to bank deposit (%) – This indicator measures private credit by deposit money banks as a share of demand, time and saving deposits in deposit money banks. It is also indicative of the degree of provision of banking services in a given country.

⁸ Insurance premium volume (as % of GDP) – This is the insurer's direct premiums earned (if Property/Casualty) or received (if Life/Health) during the previous calendar year, thus giving an indication of the extent of insurance penetration in a given country.

$$FinAccess_i^* = \theta_0 + \theta_1 Z_i + \theta_2 X_i + v_i \quad (2)$$

$$Exportmargins_i^* = \gamma_0 + \delta_1 FinAccess_i^* + \delta_2 X_i + \varepsilon_i \quad (3)$$

where *Exportmargins* is a discrete and continuous variable measuring: (a) a firm's likelihood to export; (b) a firm's export volume respectively. X_i is a matrix of control variables for firm i . $FinAccess_i^*$ is the variable of interest, that is, access of lines of credit or bank loan; and Z_i is the chosen instruments. θ and δ represent the vectors of coefficients of the controls and the variable of interest, respectively. v_i and ε_i are the error terms.

In the final section of this paper, we employ descriptive statistics to show the relationship between macro-level export diversification/concentration and economic structural transformation. Economic structural transformation is measured by the Bertelsmann Transformation Index (BTI)⁹, which is based on 14 indicators including not only economic performance, competition policy and protection of private property rights; but also contains social security and compensation, equality of opportunity and sustainability.

4 Discussions of the Estimated Results

In this section, we present results for a set of pooled OLS and dynamic panel data regressions starting with a baseline specification and adding and/or substituting various controls sequentially. Unless stated otherwise, all relationships discussed in the next paragraph will be interpreted as significant if the level of significance is at least 10% (meaning 10% or less).

4.1 Interrelationships between financial sector development, private sector development and export concentration

Table 1 presents the results of the cross-country panel regressions. The initial results are estimates of the determinants of macro-level export concentration. In columns (3) and (4), equation (1) is estimated using pooled OLS and Arellano–Bond linear dynamic panel-data estimator respectively.

The OLS estimates suggest that multidimensional financial development on its own does not directly influence export diversification, however when interacted with private sector development (proxied by the protection of private property rights and rule-based governance) we see the two variables play a complementary role in boosting export diversification. The results also show that private sector development independently contributes to export diversification. This finding is underpinned by macroeconomic models that posit that the protection of private property rights and rule-based governance affords countries a chance to innovate, improve product quality and diversify export structure, resulting in an outward shift of their export demand curve (Grossman and Helpman, 1995). However, when we estimate equation (1) using the Arellano–Bond dynamic panel data estimator to control for issues of endogeneity we begin to see a loss of statistical significance in the above-described relationships. As noted in the economic literature, “statistical noise” decreases with sample size, which in our study comes about as a result of the first-difference transformation approach of the Arellano–Bond GMM estimator.

Concerning the other covariates, the only variable that becomes statistically significant across the models is gross fixed capital formation, which is considered a measure of infrastructural

⁹ See BTI Transformation Index <https://bti-project.org/en/index/economic-transformation>

development. However, all including the exchange rate have the expected signs. GDP growth, access to electricity, provision of health services, and secondary school education are all positively associated with macro-level export diversification. In terms of the link between exchange rate and export diversification the result suggests that when exports become cheaper as a result of the depreciation of the local currency, African countries seek to rather specialise more in their export baskets than diversify their export structure. This is intuitively plausible as the exporting firms gain more competitiveness, they rather concentrate on increasing their existing export portfolio which gives them more profits than investing in new products. This suggests that improvement in terms of trade alone would not promote diversification unless accompanied by the required policy that would provide the necessary environment. In the same vein, Bahar and Santos (2018) argue that countries with higher shares of natural resources in exports have a more concentrated non-resource export basket, which may explain why African countries – most of whom are heavily endowed with natural resources – are more inclined to export concentration in the event of improved competitiveness.

Table 1 Determinants of Macro-level Export Concentration in Africa

Variable	Notation	Pooled OLS	Dynamic Panel
Theil index of conc. L.1	<i>TIE</i>		0.2652* (0.159)
Financial development	<i>FD</i>	-7.5879 (7.374)	-23.0178 (32.339)
Private property rights and rule-based governance	<i>PPRB</i>	-1.3302*** (0.308)	-0.0019 (1.255)
Financial development * Private property & rule-based	<i>FD_FB</i>	5.1458* (2.593)	2.04738 (10.327)
Ln (GDP annual growth rate)	<i>GDP_{growth}</i>	-0.0111 (0.111)	-0.0261 (0.0561)
Electricity access	<i>ELEC</i>	-0.0010*** (0.005)	-0.0218 (0.015)
Health Exp. as % of GDP	<i>HExpofGDP</i>	0.0024 (0.009)	-0.0065 (0.007)
School enrolment secondary (% gross)	<i>Schooling</i>	-0.0168** (0.009)	-0.0066 (0.007)
Official exchange rate	<i>XR</i>	-0.0001 (0.0001)	0.00003 (0.002)
Gross fixed capital formation	<i>GFCF</i>	-0.0036 (0.001)	-0.0041** (0.002)
Intercept	β_0	8.1985*** (0.994)	6.4449 (4.910)
Sargan test ^a chi (2)30 Prob>chi2			47.64 0.075
Autocorrelation test p-value			0.0810
R square:		0.4180	
No. of Observations		74	47
No. of Instruments			46

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Standard errors (clustered by country) in parentheses

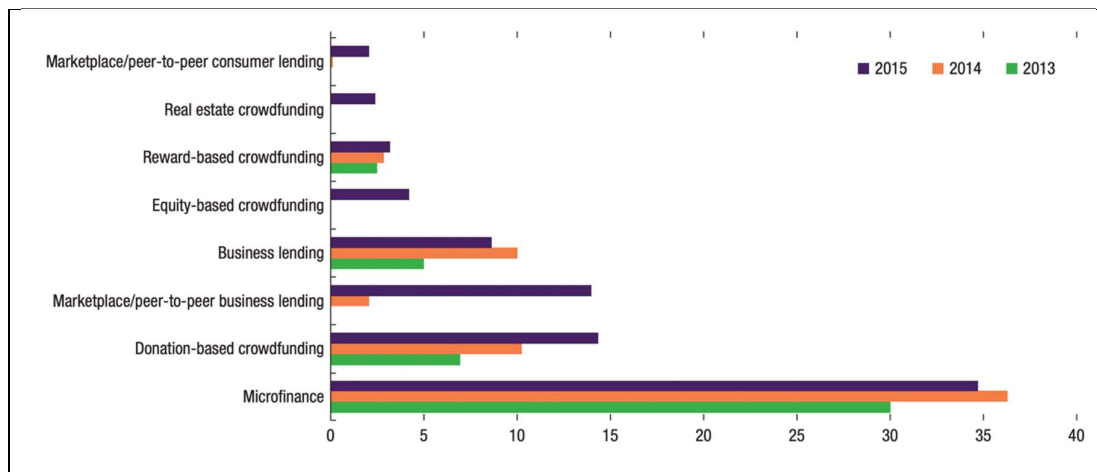
^a Test for over-identifying restrictions in dynamic panel-data estimations.

*The first-difference transformation approach of the Arellano-Bond GMM estimator significantly reduces the number of observations.

4.1.1 Alternative Measure of Financial Development – FinTech

FinTech, which is a portmanteau for financial technology, is the current term for the use of technology to supply financial services, also known as alternative finance (Makina, 2019). Alternative finance, according to the UK Alternative Finance Industry Report (2014), refers to a variety of innovative funding models that are emerging outside of the traditional banking system and that use internet platforms or websites to connect fundraisers with funders and investors. Digital payment systems, crowdfunding, peer-to-peer (P2P) consumer financing, peer-to-peer business lending, and invoice trading are examples of such models. See Figure 2 for the growth of some of these alternative FinTech-powered financing models in sub-Saharan Africa.

Figure 2 Alternative Financing Models in sub-Saharan Africa



Source: Cambridge Centre for Alternative Finance (2017)

FinTech has the potential to help African countries achieve financial and social inclusion by decreasing inefficiencies in resource allocation within the conventional banking sector and offering economic opportunities that promote financial access and social development (Ding *et al.* 2018; Salampanis and Mention, 2018). Part of FinTech's growing popularity stems from its ability to overcome long-standing hurdles, resulting in underrepresented SMEs in the financial markets. Empirical evidence suggests that the use of FinTech can help lower the incidence of trade finance rejections, especially among smaller firms (Lee *et al.* 2021).

Financial service providers can use big data analytics and artificial intelligence (AI) to lower the cost of analysing SMEs' financial data and making credit decisions without requiring the otherwise strenuous formal documentation. Such documentation can be particularly costly for smaller firms as the amounts involved are small and transactions infrequent. Trade finance activities were particularly affected by the Covid-19 pandemic. It caused global financial conditions to tighten, resulting in enormous capital outflows from Africa, which exceeded \$5 billion in the first quarter of 2020. (Afreximbank, MFW4A, UNECA and AfDB, 2020). This increased liquidity constraints and continues to weaken banks' ability to finance African trade, particularly for SMEs (Nyantakyi and Drammeh, 2020). Examples from Asia, however, show the effective reach of FinTech in the SME sector even in the context of Covid-19. An AI-enabled credit score system funded by the Asia Development Bank provided \$50,000 in financing to over 8,000 SMEs in the Greater Mekong

Subregion. Similarly, using artificial intelligence, Ant Group's 310 online lending platform has already served 29 million SMEs in China while maintaining a nonperforming loans ratio of less than 2%, even during the peak of the COVID-19 pandemic (Lee *et al.* 2021). Figure 2 shows the various innovative financing models facilitated by FinTech in Africa.

FinTech companies operating in the SME lending space are usually classified into the following categories: (i) marketplace lending; (ii) supply chain financing (SCF); (iii) non-cash merchant payments; and (iv) alternate data, advanced analytics, and underwriting process automation (IFC, 2017). Marketplace lending provides loans to individuals or micro, small, and medium-sized businesses (MSMEs) through online platforms that connect lenders and investors with borrowers. In some circumstances, the platforms provide direct loans to the eventual beneficiaries and handle balance-sheet risks, whereas, in others, they simply connect enterprises in need of finance with investors who are willing to take on more risk (IFC, 2017). These platforms offer people and small and medium-sized businesses an alternative option to obtain credit, as well as investors a chance to lend directly (World Bank, 2018). However, in Burkina Faso, despite the encouraging rapid access and use of FinTech by a significant segment of the rural and urban populations, it is yet to maximise entrepreneurship benefits (Kedir and Kouame, 2022). Informal finance is rather seen to be a stronger driver of entrepreneurship (*ibid.*).

FinTech is also changing the cross-border payment landscape. In conjunction with the African Union (AU) and the African Continental Free Trade Area (AfCFTA), the Africa Export-Import Bank (Afreximbank) unveiled a FinTech-enabled Pan-African Payment and Settlement System (PAPSS)¹⁰ to promote cross-border transactions across Africa. Prior to the launch of PAPSS, intra-Africa trade settlements required a third currency and a non-African correspondent bank, resulting in an estimated yearly loss of close to \$5 billion, subsequently impeding trade on the continent. The system is expected to save African enterprises huge transaction costs each year. PAPSS is also projected to accelerate export diversification as a result of AfCFTA's creation of a single market throughout Africa.

It is for the above reasons that we estimate equation (1) using an alternative measure of financial development, FinTech – proxied by mobile money registered accounts per 1000 adults (aged 15+). The selection of mobile money penetration as a proxy for FinTech in Africa is well informed by the literature (see Kanga *et al.*, 2021; Makina, 2019). Given that OLS estimates can be biased due to possible endogeneity issues, we focus on the results produced by the Arellano-Bond GMM estimations.

¹⁰ This is a revolutionary Financial Market Infrastructure to enable instant, cross-border payments in local currencies between African markets. <https://www.afreximbank.com/afreximbank-and-afcfta-announce-the-operational-roll-out-of-the-pan-african-payment-and-settlement-system-papss/>

Table 2 FinTech, Private Sector Development and Export Concentration

Variable		Pooled OLS	Dynamic Panel
Theil Index of Concentration	<i>TIE</i>		.222
L1.			(.142)
M-money accounts per 1000	<i>Mmoney</i>	0.004	.007**
		(.003)	(.003)
Private property rights & rule-based	<i>PPR</i>	-.584**	.849***
		(.242)	(.318)
Property rights & rule-based	<i>PPR_PS</i>	0.002	-.002**
x M-money		(.001)	(.001)
Electricity access	<i>ELEC</i>	0.005	-.026
		(.006)	(.017)
Government health expenditure	<i>HexpofGDP</i>	.011	-.004
(% of GDP)		(.01)	(.009)
Secondary school enrolment	<i>Schooling</i>	-.007	-.038*
		(.007)	(.021)
Official exchange rate	<i>XR</i>	0.0001*	.001
		(0.001)	(.002)
GDP Growth rate	<i>GDP</i>	-.023	-.049
		(.107)	(.047)
Gross fixed capital formation	<i>GFCF</i>	-.01***	-.005*
		(.003)	(.003)
Intercept	<i>Cons_</i>	6.457***	3.019
		(.515)	(2.057)
No of observations		73	47 ¹¹
No of instruments			46
R square		0.36	
Sargan test chi (2)31			41.7
Prob>chi2			0.201
Autocorrelation test (p-value)			0.007

Robust standard errors are in parentheses; *** p<.01, ** p<.05, * p<.1.

The dependent variable is the Theil Index of Concentration¹²

The Arellano-Bond GMM estimates show that private sector development and FinTech growth independently push countries to specialise more in their export basket rather than diversify. However, their interaction effect drives countries toward greater export diversification. Although it is widely acknowledged that the positive externalities of rapid FinTech growth potentially democratize the provision of financial services (Bollaert et al 2021) – which helps to bridge the financing gap for SMEs to support export diversification – our results suggest that its development in Africa may not have yet reached the maturity level required to influence a paradigm shift in export expansion and diversification on the continent. It must also be noted that FinTech does not come without risks. Due to the innovativeness, opacity and complexities associated with FinTech

¹¹ The period under consideration has limited data, with the first-difference transformation approach of the Arellano-Bond GMM estimator significantly reducing the number of observations.

business models for which users can be unfamiliar with, there is often a heightened risk of loss from fraudulent activities or misconduct by operators and/or other third parties. Most African economies lack the robust regulatory structures to efficiently tackle these issues, thus are less likely to realise its diversification-inducing potential as confirmed in Table 2.

The results on the other explanatory variables remain robust to this alternative specification so no further commentary is provided at this point.

4.1.2 Financial Services, private sector development and macrolevel export diversification

In this section, we explore the interrelationships between specific financial services (banking services and insurance services), private sector development and export diversification.

The results from Table 3 suggest that while banking services push countries to specialise in the production and export of commodities for which they have a comparative advantage, insurance services provide countries with the cushion to diversify their export portfolio. Even during periods of banking sector development, banks in most African countries may not always extend banking services to every firm that could make use of them due to the interrelated problems of information asymmetries and high transaction costs. It is for similar reasons that the provision of bank credit in most African countries is structured in a way that precludes most recipient firms (especially smaller ones) from taking extra risks in the form of venturing into other new product lines. Insurance on the other hand, plays an important role in spreading risk, thus encouraging firms to venture into new product lines and markets. Specifically, export credit insurance covers potential buyer defaults and unforeseeable risks caused by war, natural disasters, and other unforeseen catastrophes. This form of insurance helps exporters in managing their assets and the risks associated with them (Cirera, Marin and Markwald, 2012).

Other notable results include the interaction effect of banking services and protection of private property rights on export diversification. The result suggests that protection of private property rights and banking services play a complementary role in export diversification, i.e., developing the banking sector alone without a good degree of private property rights protection is not enough to induce export diversification. Based on the interaction effect of financial development and protection of private property rights (see Table 3) one would have also expected banking services and protection of private property rights to be substitutes. However, the contrasting results go to show that financial development is multidimensional, with the depth of banking services being only one component.

Table 3 Export Diversification, Financial Services and Private Sector Development: Dynamic Panel Results

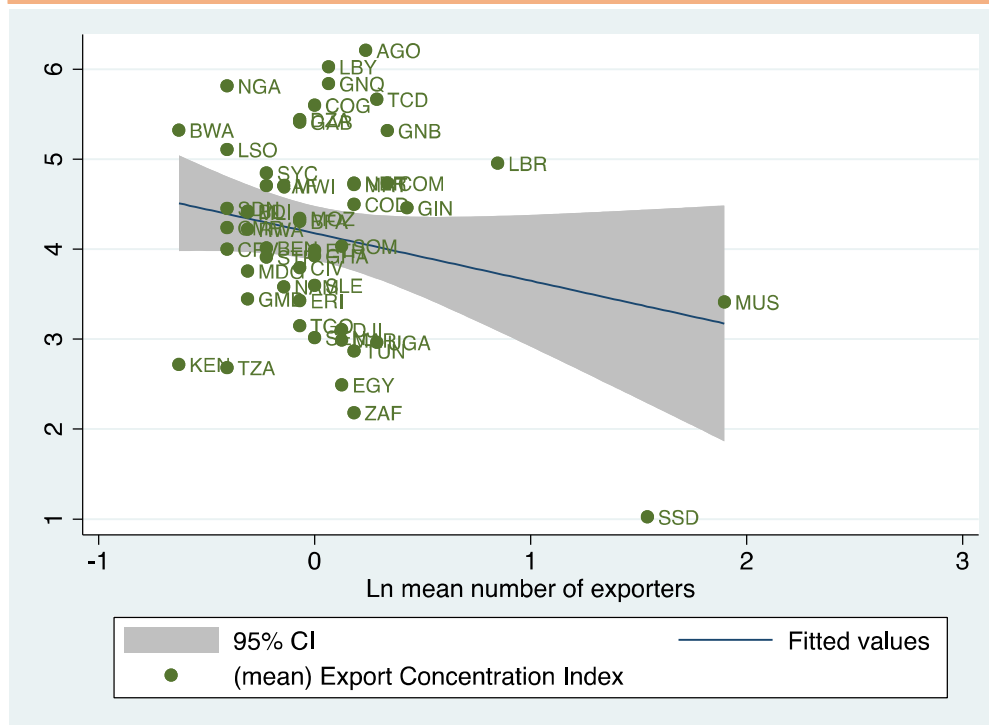
Variable			(1)	(2)
			Bank credit to bank deposit %	Insurance Premium Volume to GDP (%)
Theil Index of concentration L1.		<i>TIE</i>	0.1548 (0.249)	0.0559 (0.146)
Financial services		<i>FIN_services</i>	0.0563 (0.051)	-4.1888 (5.082)
Property rights & rule-based governance		<i>PPR</i>	1.8716* (1.069)	0.3898 (0.444)
Financial services x Property rights		<i>FIN * PPR</i>	-0.0193 (0.014)	1.0855 (1.404)
Electricity access		<i>ELEC</i>	-0.0201* (0.011)	-0.0280 (0.018)
Government health expenditure (% of GDP)		<i>HexpofGDP</i>	0.0004 (0.012)	0.0255* (0.016)
School enrolment		<i>Schooling</i>	-0.0280 (0.023)	0.0011 (0.013)
Official Exchange Rate		<i>XR</i>	0.0003 (0.002)	0.0011 (0.013)
In GDP Growth Rate		<i>GDP</i>	-0.0205 (0.003)	-0.0708 (0.063)
Gross fixed capital formation		<i>GFCF</i>	-0.0052** (0.003)	-0.0018 (0.051)
Intercept		<i>Cons_</i>	0.136 (3.249)	2.6102 (2.863)
No of observations			45	35
No of instruments			46	36
Sargan test chi2 (35)			49.73	32.70
Prob>chi2			0.051	0.139
Autocorrelation test (p-value)			0.0023	0.0007

Robust standard errors are in parentheses; *** p<.01, ** p<.05, * p<.1.
The dependent variable is the Theil Index of Concentration

4.1.3 Micro characteristics of the Export Sector and Export Diversification

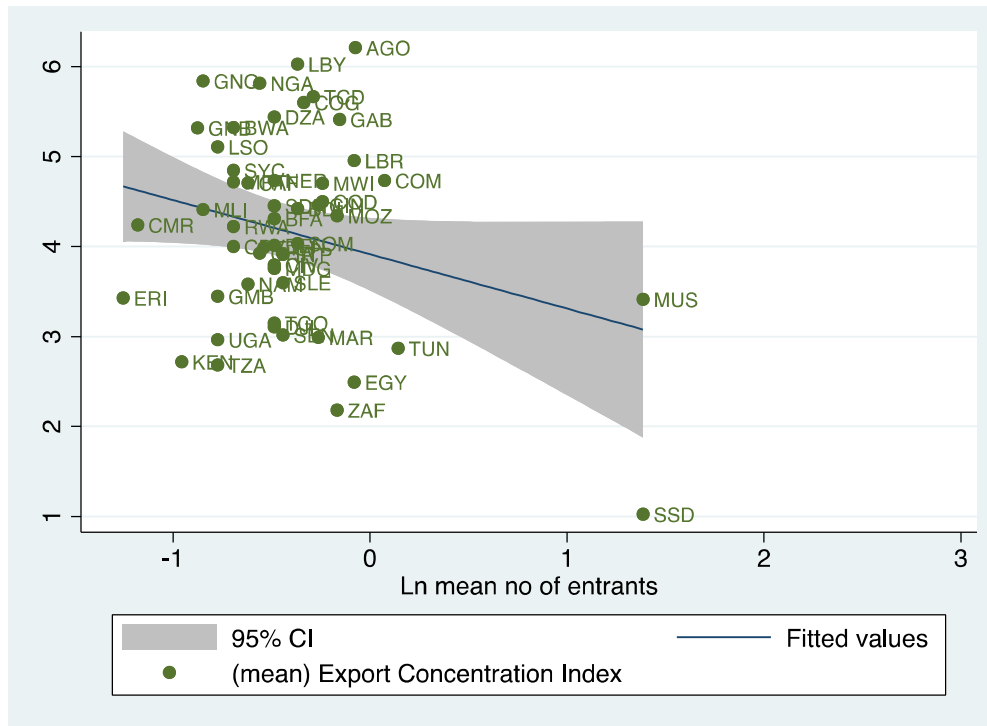
Using data from the Exporter Dynamics Database, we present descriptive results of the relationship between the micro characteristics of the export sector in 54 African countries and export diversification over the period 2000 - 2014. It is evident from figures 3-9 that the number of exports, number of entrants, number of exiters, unit price per export, growth of incumbents and number of exporters per HS6 products are all positively associated with macro-level export diversification.

Figure 3 Export Concentration vs Number of Exporters (2000 – 2014)



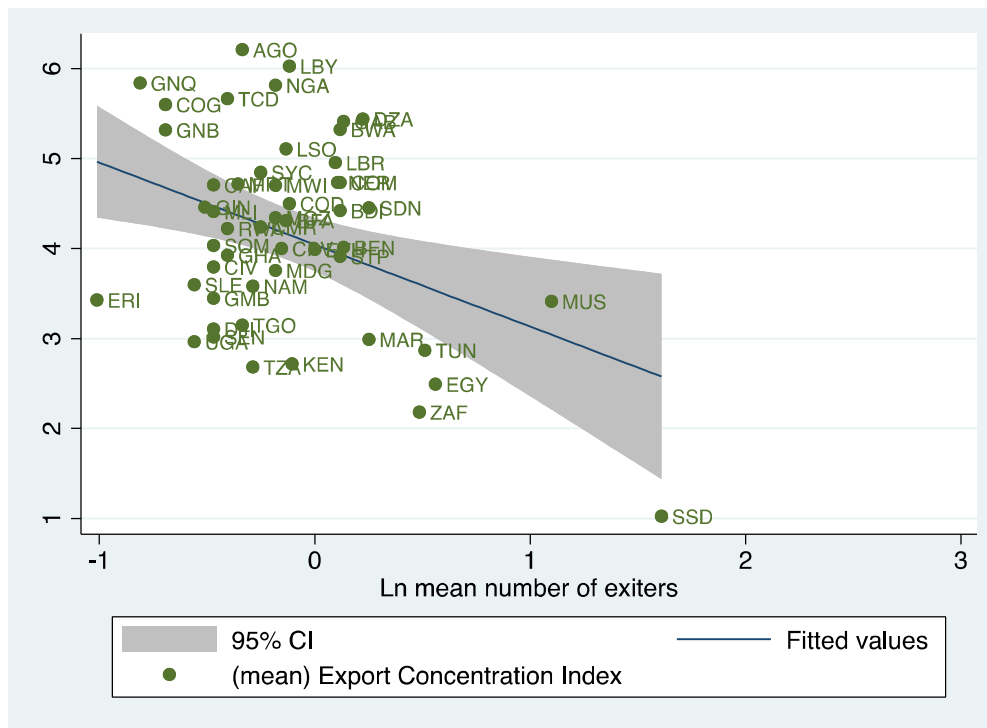
Export diversification, in particular, refers to an increase in the range of goods and services that an economy exports to the rest of the world or to the markets to which they export. As such the greater the number of exporters in an economy the higher the level of export diversification. With a high number of exporters, there is likely to be a move from the export of one or a few primary commodities to that of a wider set of manufactured goods and services. This theoretical predisposition appears to be supported by the scatterplot shown in figure 3.

Figure 4 Export Concentration vs Number of Entrants (2000 – 2014)



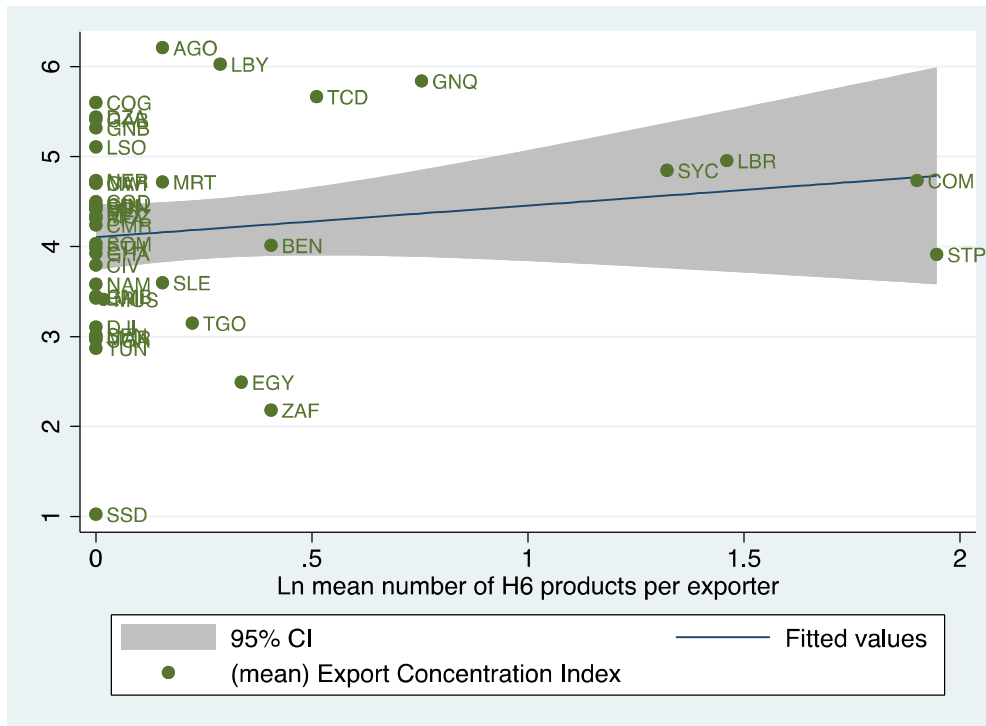
Similarly, as shown in figure 4, an increase in the number of entrants into an economy is likely to add to the number of existing exporters, resulting in an expansion of the export basket, which could then be exported to a larger number of destination countries and contribute to export diversification. These increases in exported commodities and trading partners are frequently related to participation in new global value chains, which can allow countries to benefit from forward linkages and help domestic enterprises to become more competitive globally through technology transfers and efficiency benefits.

Figure 5 Export Concentration vs Number of Exiters (2000 – 2014)



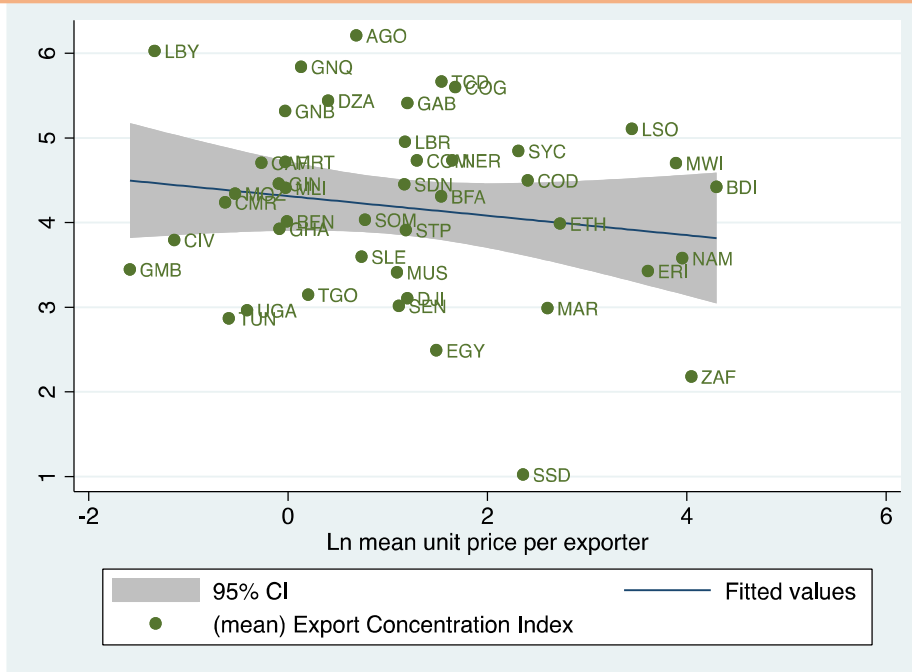
Surprisingly, the number of exiters appears to be positively correlated with export diversification. Given the earlier theoretical explanation given for the link between the number of entrants and export diversification, one would have expected the opposite result for the number of exiters. However, we argue that the number of exiting exporters is more likely to belong to the class of exporters that are engaged in the export of raw materials (rather than value-added good and services), and so their exit is likely to aid export diversification by allowing existing value-added exporting firms to exploit their market power and economies of scale to scale up exports of their good and services. Since the export of raw materials does not provide a competitive edge, such firms are more likely to exit to make way for more value-added export-oriented firms, and this perhaps explains why there is a positive relationship between the number of exiters and export diversification.

Figure 6 Export Concentration vs Number of H6 products per exporter (2000 – 2014)



From figure 6, we see that there is a direct relationship between the number of H6 products per exporter and export concentration. The finding suggests that there are only one or a few primary commodities being exported by African countries, and that is why an increase in the number of H6 products being exported is related to export concentration rather than the desired export diversification. This is not surprising because as noted by Usman and Landry (2017), raw materials continue to account for the majority of African exports, accounting for 52% of overall exports in 2017.

Figure 7 Export Concentration vs Unit Price per Exporter (2000 – 2014)



On the other hand, as displayed in figure 7, the higher the unit price per exporter, the higher the incentive to expand the export basket and export to a larger number of destination countries. In order to attract a higher unit price and enhance export diversification, exporters must shift from the export of one or a few primary commodities to the export of a broader range of manufactured goods and services.

Figure 8 Export Concentration vs Growth of Incumbent (2000 – 2014)

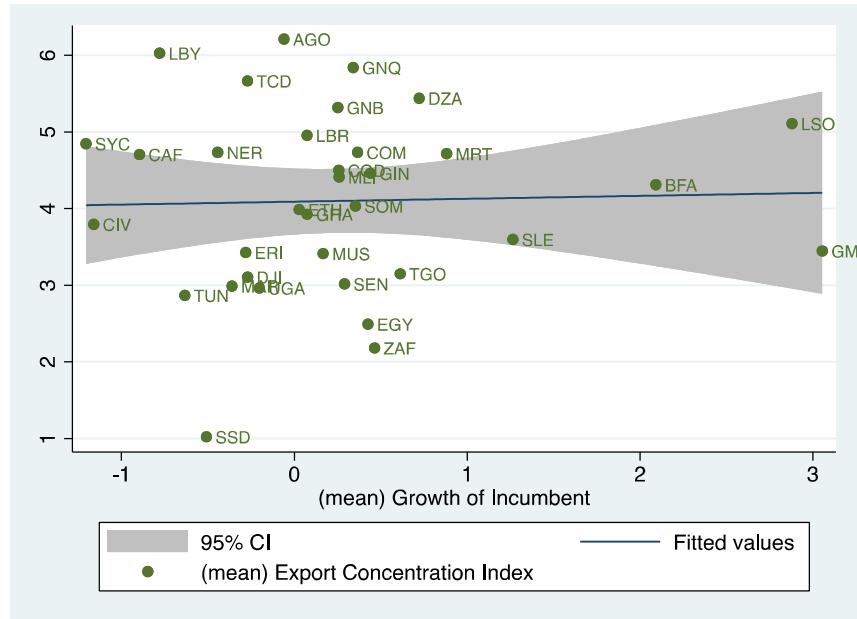
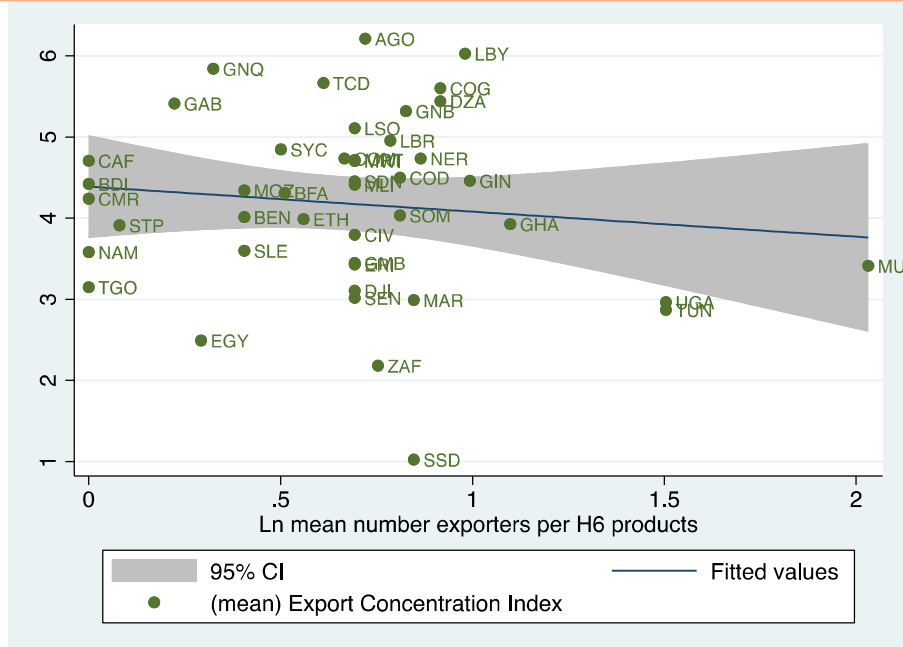


Figure 8 presents an interesting but important finding. The finding suggests that the growth of incumbent export firms in African countries is positively correlated with export concentration. What this suggests is that export firms in Africa grow they tend to specialise more in their export baskets than diversify their export structure. Fortunately, this paper presents evidence of some of the complementary policy measures that can be explored by African countries to achieve a sustained level of export diversification.

Figure 9 Export Concentration vs Number of Exporters per H6 Products (2000 – 2014)



As we have established earlier in this section, the broader the range of manufactured goods and services the higher the prospect of export diversification. Figure 9 suggests that an increase in the number of exporters per H6 product leads to a corresponding increase in export diversification. The number of exporters per H6 product is an indication of the range of goods and services in the export basket of an economy, which is also positively related to export diversification. However, it is worth pointing out that this result is undergirded by the nature of good and services being exported as well as the number of destination countries.

It must however be noted that the descriptive nature of the above analysis means that the results should be interpreted as associations and not causation. As more data becomes available, there would be the need to build on these descriptive analyses to produce more robust econometric results from which causal claims can be made.

4.1.4 Access to credit, firm-level characteristics, and intensive and extensive margin of exports

Using data from the World Bank Enterprise Surveys, we estimate at the firm level the intensive and extensive margins of trade equations (2 & 3) using IV techniques and present the results in columns (1) and (2) of table 4 respectively. The theoretical justification (explained in the methodology section) for using past sales and the value of collateral as instruments is supported by the statistical tests. The proposed test for weak instruments is based on Cragg and Donald (1993), where an F-statistic less than or equal to 10 indicates that the set of instruments used is weak. We conclude that the instruments are strong because the F-statistic across all models is greater than 10. We also used the Sargan-Hansen Test of over-identifying restrictions to confirm the instruments' validity; a p-value larger than 0.05 suggests that the instruments are valid. Although we detect serial correlation in the panel series using the Woolridge test for autocorrelation, we adjust for it by way of clustering.

The results are reported in table 4. In column (2), the outcome variable is transformed to exports as a share of the total sales of the firm, while the dependent variable in column (3) indicates the likelihood of the firm to export. The results show that firms with access to lines of credit or loans from a financial institution have both a greater likelihood of exporting (extensive margin) and higher export volume (intensive margin), with both intensive and extensive margin effects being statistically significant. Interestingly though, access to an overdraft facility appears not to increase a firm's export volume but brightens the firm's chances to export. This is because an overdraft is seen more as a short-term facility serving as a safety net for firms in times of unforeseen contingencies rather than a facility that can be used to expand export volumes.

Results on the ownership structure of firms show that the greater the private foreign stake there is the higher the likelihood of exporting and the greater the export value. On the other hand, firms with greater government/state participation are likely to export, although are likely to have a low intensive margin. The results also suggest that firms with greater private domestic participation tend to have a lower intensive margin and are less likely to export.

The gender of the firm's manager is found to be statistically insignificant for both intensive and extensive margins. This means that a manager's gender does not affect the firm's chances of exporting; neither is it an important contributing factor to the firm's intensive margin. According to the results, what really matters are access to an internationally recognised quality certification

and size (classified as SME or a large firm). As adduced from Table 4, firms with an internationally recognised quality certificate are more likely to export and, if already exporting, increase the volume. Quality certification has a statistically stronger effect on the intensive margin relative to the extensive margin. Large firms (with > 99 employees) are also found to be statistically significant for both intensive margin and extensive margin. This suggests SMEs (with < 100 employees) are less likely to export and even if they do, they export less.

Interestingly, the age of a firm does not affect the chances of exporting influence. Age also doesn't appear to contribute to intensive margin. The linear relationship we find is to some extent consistent with studies such as Love *et al.* (2016) who argue that sclerotic thinking, inflexibility, and the inability to adjust strategy and/or behaviour are all linked to a firm getting older. Similar arguments are also shared by Kirpalani & McIntosh (1980). However, it must be noted that there is a possible non-linear relationship between firm age and export decisions as well as performance which must be investigated in future research.

Table 4 IV Estimates of Intensive and Extensive Margins of Trade

Variable	IV 2SLS	IV Probit
	(1)	(2)
	Intensive Margin	Extensive Margin
Access to a line of credit or loan (dummy)	27.255** (12.877)	.2643** (.1062)
% owned by government/state	-.077 (.063)	.0009 (.0066)
% owned by private domestic	-.01 (.023)	-.0023* (.0013)
% owned by private foreign	.038 (.026)	.0003 (.0015)
Internationally recog. quality cert	7.057*** (1.028)	.3239*** (.0831)
Size (log)	.955 (.97)	
Age (log)	-2.194** (.944)	-.95*** (.0909)
Female manager of business (dummy)	-3.063 (1.995)	.1001 (.0871)
Access to an overdraft facility (dummy)	-2.607 (2.294)	.1071 (.0746)
SME (dummy)	-5.613*** (1.838)	-.1974** (.0871)
_cons	-7.702 (9.569)	.3985 (.2724)
Cragg-Donald F-stat	19.35	
Sargan Test (over-identification test)	0.506	
Chi-sq (1) P-value	0.4767	(.146)
Wald test of exogeneity chi2(1)		0.76 0.382

Observations	3,479 ¹³	24,451
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*Robust standard errors are in parentheses; *** p<.01, ** p<.05, * p<.1*

Note 1: ivreg2 Stata command used to produce 2SLS estimates – Instrumented: Access to a line of credit or loan (dummy); Included instruments: % owned by government/state, % owned by private domestic individuals and organisations, % owned by private foreign individuals and organisations, possess an internationally recognised quality certificate, Size (log), Age (log), Female manager, Have access to overdraft SME (dummy); Excluded instruments: Total annual sales 3 years ago, Approximate value of collateral needed as a % of loan value or line of credit.

Note 2: ivprobit Stata command used to produce ivprobit estimates – Instrumented: Access to a line of credit or loan (dummy)

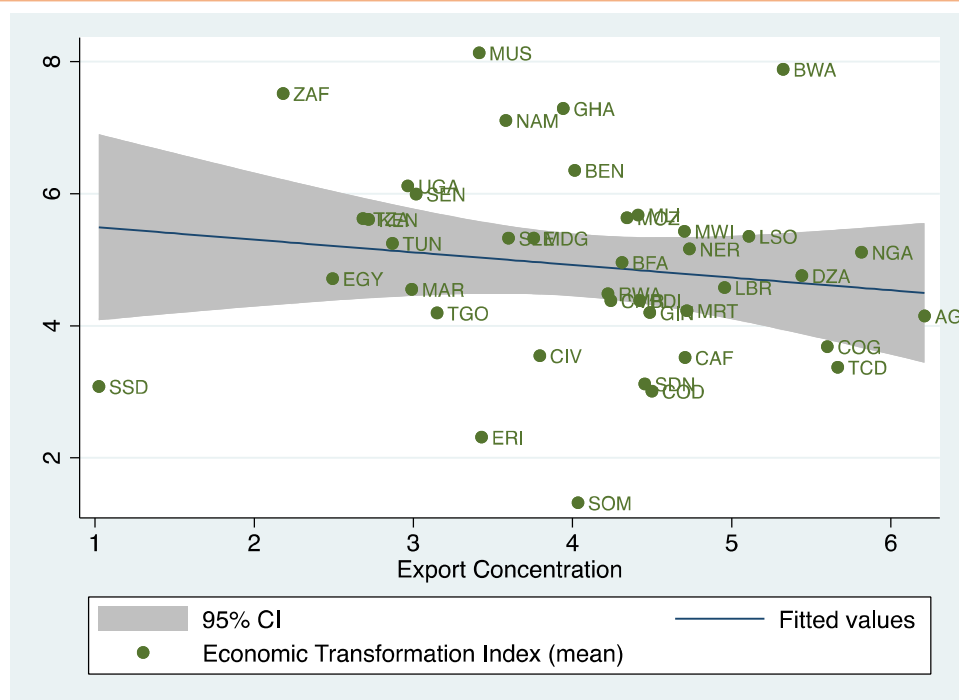
Instruments: % owned by government/state, % owned by private domestic individuals and organisations, % owned by private foreign individuals and organisations, possess an internationally recognised quality certificate, Size (log), Age (log), Female manager, Have access to overdraft SME (dummy), Account ownership and Total annual sales 3 years ago.

4.2 Link between Export Diversification and Structural Transformation: Descriptive Analysis

The debilitating effects of Covid-19 have given new impetus to African countries to pursue structural economic transformation as a way to achieve sustained growth and shared prosperity. It is critical to explore what programmes and policies underpin the transformation agenda on the continent. That is why this section takes a first step at linking export diversification with multidimensional economic transformation so that as consistent data on vital indicators of economic transformation become available more robust analysis can be undertaken.

¹³ There was an unusual drop in the number of observations when we finally found strong and valid instruments. As widely documented in the literature finding strong and valid instruments is often difficult, and in this study unfortunately resulted in a significant reduction in the number of observations for the IV-2SLS estimation.

Figure 10 Export Diversification and Structural Economic Transformation (2006-2012)



Data source: Exporter Dynamic Database and Transformation Atlas¹⁴

As adduced from our cross-country regression analysis (presented in Figure 10), export diversification is directly related to structural economic transformation. Here, the economic transformation is measured by the BTI transformation index, where the state of economic transformation is assessed using seven criteria based on a total of 14 indicators¹⁵. The BTI's definition of a market economy encompasses not only economic performance, regulatory or competition policy, and property rights, but also social inclusion factors such as social safety nets, equality of opportunity, and sustainability. In BTI terms, economic transformation entails not only economic progress but also effective poverty alleviation and the freedom of action and choice for as many persons as possible.

Our finding adds to the emerging strand of literature looking into how export diversification can contribute to economic transformation (Mania and Rieber, 2019). Although our measure of economic transformation is multidimensional and improves upon existing measures, it is important to note that given the cross-sectional nature of the data these results are interpreted only as associations, not causal effects. In the conclusion section, we highlight the need for future studies to rigorously test this causal relationship using more comprehensive measures including that provided by BTI Transformation Index¹⁶.

¹⁴ <https://bti-project.org/en/atlas>

¹⁵ <https://bti-project.org/en/methodology>

¹⁶ <https://bti-project.org/en/methodology>

5 Conclusions and Policy Implications

Although financial development has been hitherto studied as an important driver of export diversification, emerging literature highlights more prominently the relevance of governance and institutional frameworks as prerequisites to export diversification. This paper contributes to this emerging strand of literature by examining the independent and joint role of financial development and the protection of property rights and rule-based governance in spurring export diversification in Africa.

Our primary results show that the relationship between finance and export diversification as well as the moderating role of rule-based governance is not straightforward. Improvements in an economy's rule-based governance systems are linked to a more diversified export base consistent with Belgibayeva and Plekhanov (2019) who argue that rule-based governance and protection of private property rights can translate into reduced conflicts and civil wars that stifle investment and export diversification. Correspondingly, the results suggest that the weakness and unreliability of institutions can have implications for over-regulation, bureaucracy and political instability, all of which undermine the diversification agenda by negatively affecting investment and entrepreneurial activities.

When we introduce FinTech as an alternative measure of financial development (proxied by access to mobile money) and re-estimate equation (1) with the Arellano-Bond estimator we find that FinTech does not induce export diversification. However, when interacted with protection of private property rights and rule-based governance (also a proxy for private sector development) we find a positive association with export diversification. We argue that FinTech in Africa is yet to reach a high development stage where economies can leverage to support the financing of value-added productive activities. For example, mobile money, the most commonly used FinTech in sub-Saharan Africa, is mostly being utilised to advance short-term microloans to users. The importance of recognising the synergies between FinTech and protection of property rights and the potential for export diversification in Africa could not have been overemphasized by the results. Policymakers must therefore acknowledge that financial sector (including FinTech) policies and rule-based governance are largely complementary for the effective implementation of export diversification initiatives.

In terms of specific financial services, insurance is more potent than banking services in pushing African countries to diversify their export portfolio. This is because venturing into new product lines for export in Africa is generally viewed as risky, thus it is only likely to be undertaken when such risks are hedged with insurance products and services. For start-ups and SMEs, banks will usually only fund their existing product lines rather than new ones. The results, however, indicate that banking and protection of private property rights and rule-based governance play a complementary role in promoting export diversification – banking services alone do not suffice.

Regressing export diversification on export-sector firm dynamics, we find that the number of exports, number of entrants, number of exiters, unit price per export, growth of incumbents and number of exporters per HS6 products all contribute to macro-level export diversification. Given the cross-sectional nature of this analysis, we exercise caution in the interpretation of the results, only serving as a stepping stone to more robust analysis in the future when longer and comparable panel data becomes available.

Subsequently, we put a lens on the drivers of extensive and intensive margins of exports in Africa. Expectedly, we find that access to credit lines or loan from financial institutions, access to an internationally recognised quality certification, and greater private foreign stake in a firm's ownership positively influence a firm's decision to export as well as improve their export volume. Larger entities, compared to SMEs, are more predisposed to export, demonstrating also a greater contribution to intensive margin of exports relative to SMEs. This finding underpins the need for increased access to long-term finance for SMEs. From a theoretical perspective, this is where FinTech (accompanied by appropriate regulatory frameworks) is badly needed to address the asymmetric information problem inherent in financing decisions for SMEs, so that funds can also flow easily into this traditionally neglected but promising sector. Two implications follow from the above results in terms of policy and entrepreneurial support. Stronger protection of property rights and rule-based governance in addition to guaranteeing a level playing field for enterprises (especially SMEs) to compete are all prerequisites for promoting export diversification.

Having explored the determinants of export diversification both at the aggregate level and firm-level, we concluded the paper by attempting to relate export diversification to economic structural transformation in a cross-sectional setting as a way of encouraging future studies to add to the limited literature examining the nature and extent of the relationship between the two variables from a multidimensional perspective. This will require longer panels and more robust methodological approaches. From the policy perspective, this is an exciting opportunity to see if export diversification goes beyond being an end goal to becoming a means to another end.

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Appendix

Table 1a Summary Statistics –Observations for 54 African countries over the period 2000 – 2014

Variable	Obs	Mean	Std. Dev.	Min	Max
Theil index of export conc.	765	4.169	1.218	0	6.33
Financial development ind.	1040	.142	.109	0	.646
Private property rights ind.	585	2.759	.61	1	4
Electricity access	450	48.507	28.797	2.69	100
Health exp. (% of GDP)	379	34.019	17.901	4.154	77.476
School enrolment (sec.)	250	53.368	23.254	9.689	109.444
Official exchange rate	839	810.119	2306.87	.055	22148.9
GDP growth rate (log)	403	1.355	.794	-3.387	4.813
Gross fixed capital accum.	394	6.322	30.366	-49.32	466.889
Fixed broadband subs.	445	1.761	4.041	0	35.554
Insurance premiums	609	.782	2.095	.001	15.784
Bank credit to bank deposit	787	69.83	28.327	9.221	180.688

Notes: obs = observations; conc = concentration; exp = expenditure; sec = secondary; accum = accumulation; ind = index; Dev = deviation; dev = development

Table 1b Summary Statistics –Observations for 45 African countries over the period 2005 - 2021

Variable	Obs	Mean	Std. Dev.	Min	Max
Intensive Margin	42892	5.105	17.798	0	100
Extensive Margin	44060	.006	.076	0	1
% of State-owned firms	43242	.682	6.126	0	100
% of Private Domestic	43238	83.672	34.431	0	100
% of Private Foreign	43206	10.527	28.317	0	100
Access to Int Rec. Qual Cer	44060	.148	.356	0	1
Size (log)	43566	3.021	1.297	-1.099	10.714
Age (log)	33298	3.073	.537	1.386	5.38
Female manager (dummy)	44060	.091	.288	0	1
Access to overdraft	44060	.279	.449	0	1
SME (dummy)	44060	.862	.345	0	1

Note 1: Based on the following: Angola (2006, 2010), Botswana (2006, 2010), Burkina Faso (2009), Cameroon, Congo (2009), (2009, 2016), Ivory Coast (2009, 2016), Democratic Republic of Congo (2006, 2010, 2013), Egypt (2013), Ethiopia (2011), Ethiopia (2015), Gambia (2006), Ghana (2007, 2013), Guinea (2006, 2016), Kenya (2007, 2013), Lesotho (2016), Madagascar (2009, 2013), Malawi (2014), Mali (2007, 2010, 2016), Mauritania (2006, 2014), Mauritius (2009), Morocco (2013), Mozambique (2007), Namibia (2006, 2014), Nigeria (2007, 2014), Rwanda (2006), Senegal (2007, 2014), South Africa (2007, 2014), Sudan (2014), Swaziland (2006, 2016), Tanzania (2006, 2013), Tunisia (2013), Uganda (2006, 2013), Zambia (2007, 2013) and Zimbabwe (2016).

Note 2: Int. = Internationally; Rec. = Recognised; Cert = Certificate

Table A1. Data sources and variable descriptions

Variable	Description/Measure/Proxy	Source ^a
Theil index of export concentration	Export Diversification Index	IMF_a
FinTech	Fixed broadband subscriptions (per 100 people)	IMF_c; WDI
Financial Development Index	A comprehensive index encompassing the depth of financial institutions, access to financial institutions, the efficiency of financial institutions, the depth of financial markets, access to financial markets, and the efficiency of financial markets are all included in the financial development index	IMF_b
Financial services	Insurance premiums, life and non-life to GDP Bank credit to bank deposit	IMF_b, WDI
FI access	Financial Institutions Access Two indicators: Bank branches per 100,000 adults; ATMs per 100,000 adults	IMF_b
FI efficiency	Financial Institutions Efficiency Six indicators: Net interest margin; Lending-deposits spread; Non-interest income to total income; Overhead costs to total assets; Returns on assets; Returns on equity	IMF_b
Private sector development	Measured by the degree of protection of property rights and rule-based governance rating	WDI
Exchange Rate	Principal exchange rate based on monthly average: Local currency units relative to the US dollar	African Development Indicators
GDP	GDP growth rate (annual)	WDI
Infrastructure development	Access to electricity (Proportion of population with access to electricity)	WDI
Investment	Gross fixed capital accumulation	WDI
Human Capital	School enrolment, secondary (% gross)	WDI
Health	Current health expenditure per capita (current US\$)	WDI
Rule-based governance	Protection of property rights: the quality of contract enforcement and the protection of property rights	WDI

^a EDD: Exporter Dynamics Database – Indicators at Country-Year Level; IMF_a: Export Diversification Database; IMF_b: Financial Development Index Database introduced by Svirydenka (2016); IMF_c: Financial Access Surveys; WDI: World Development Indicators; WGI: World Governance Indicators

Table A2 Data Sources and Variable Description

Variable	Description/Measure/Proxy	Source
Extensive margin	Likelihood to export	World Bank Enterprise Surveys
Intensive margin	Export volume/export value	
Ownership	% of private domestic individuals and organisations	
Structure of Firm	% of private foreign individuals and organisations % of state/government	
Export Certification	Access to an internationally recognised quality certification	
Gender	Gender of top manager of firm	
Size	Total Number Of Full Time Employees, Adjusted For Temporary Workers	
Type of firm	Whether SME of large entity	
Finance	Access to line of credit or loan from financial institution Access to overdraft facility	
Age	How long the firm has been in operation for	

Table A3 Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Export concentration index	1.000											
(2) Fin sector development index	0.163	1.000										
(3) Private property rights index	-0.357	0.486	1.000									
(4) Electricity access	-0.296	0.582	0.478	1.000								
(5) Gov. health expenditure	-0.003	0.539	0.725	0.345	1.000							
(6) School enrolment (secondary)	-0.268	0.624	0.493	0.822	0.558	1.000						
(7) Official exchange rate	-0.074	-0.299	-0.407	-0.195	-0.304	-0.172	1.000					
(8) GDP growth rate (log)	-0.088	-0.265	-0.140	-0.214	-0.201	-0.247	0.056	1.000				
(9) Gross fixed capital accum.	-0.285	-0.146	-0.116	0.023	-0.144	0.055	-0.055	0.199	1.000			
(10) Fixed broadband subs.	-0.096	0.676	0.581	0.647	0.660	0.747	-0.161	-0.462	-0.112	1.000		
(11) Insurance premiums	-0.044	0.127	0.274	-0.022	0.430	0.192	-0.165	0.087	-0.029	-0.091	1.000	
(12) Bank credit to bank deposit	0.081	-0.027	0.245	-0.198	-0.012	-0.316	-0.279	-0.177	-0.469	0.059	-0.284	1.000

Table A4 Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) intensive margin	1.000											
(2) extensive margin	0.083	1.000										
(3) % of private domestic	-0.136	-0.017	1.000									
(4) % of private foreign	0.146	0.020	-0.743	1.000								
(5) % of state-owned	0.049	-0.003	-0.180	0.012	1.000							
(6) int recog. qual certi	0.194	0.012	-0.100	0.134	0.068	1.000						
(7) gender of top manager	-0.024	0.017	0.038	-0.035	-0.013	-0.034	1.000					
(8) access to overdraft	0.095	0.018	-0.027	0.069	0.015	0.135	0.012	1.000				
(9) access to line of credit	0.085	0.022	0.007	0.028	0.017	0.103	-0.008	0.345	1.000			
(10) SME (dummy)	-0.236	-0.012	0.112	-0.148	-0.106	-0.322	0.067	-0.200	-0.166	1.000		
(11) Firm age	0.044	-0.106	-0.011	0.013	0.082	0.195	-0.042	0.124	0.096	-0.212	1.000	
(12) Size of firm	0.271	0.024	-0.130	0.180	0.114	0.376	-0.092	0.268	0.213	-0.770	0.285	1.000

Int = internationally; recog. = recognised; qual = quality; certi = certification

Table A5 List of African Countries Used in Panel Study

Country	Code	Region
1. ALGERIA	DZA	MENA
2. ANGOLA	AGO	SSA
3. BENIN	BEN	SSA
4. BOTSWANA	BWA	SSA
5. BURKINA FASO	BFA	SSA
6. BURUNDI	BDI	SSA
7. CAMEROON	CMR	SSA
8. CAPE VERDE	CPV	SSA
9. CENTRAL AFRICAN REPUBLIC	CAF	SSA
10. CHAD	TCD	SSA
11. COMOROS	COM	SSA
12. CONGO	COG	SSA
13. CONGO, THE DEMOCRATIC REPUBLIC OF THE	COD	SSA
14. COTE D'IVOIRE	CIV	SSA
15. DJIBOUTI	DJI	MENA
16. EGYPT	EGY	MENA
17. EQUATORIAL GUINEA	GNQ	SSA
18. ERITREA	ERI	SSA
19. ETHIOPIA	ETH	SSA
20. GABON	GAB	SSA
21. GAMBIA	GMB	SSA
22. GHANA	GHA	SSA
23. GUINEA	GIN	SSA
24. GUINEA-BISSAU	GNB	SSA
25. KENYA	KEN	SSA
26. LESOTHO	LSO	SSA
27. LIBERIA	LBR	SSA
28. LIBYAN ARAB JAMAHIRIYA	LBY	MENA

29. MADAGASCAR	MDG	SSA
30. MALI	MLI	SSA
31. MALAWI	MWI	SSA
32. MAURITANIA	MRT	MENA
33. MAURITIUS	MUS	SSA
34. MOROCCO	MAR	MENA
35. MOZAMBIQUE	MOZ	SSA
36. NAMIBIA	NAM	SSA
37. NIGER	NER	SSA
38. NIGERIA	NGA	SSA
39. RWANDA	RWA	SSA
40. SAO TOME AND PRINCIPE	STP	SSA
41. SENEGAL	SEN	SSA
42. SEYCHELLES	SYC	SSA
43. SIERRA LEONE	SLE	SSA
44. SOMALIA	SOM	SSA
45. SOUTH AFRICA	ZAF	SSA
46. SOUTH SUDAN	SSD	MENA
47. SUDAN	SDN	MENA
48. SWAZILAND	SWZ	SSA
49. TANZANIA, UNITED REPUBLIC OF	TZA	SSA
50. TOGO	TGO	SSA
51. TUNISIA	TUN	MENA
52. UGANDA	UGA	SSA
53. ZAMBIA	ZMB	SSA
54. ZIMBABWE	ZWE	SSA

SSA = SUB-SAHARAN AFRICA; MENA = MIDDLE EAST AND NORTH AFRICA