Sources of Market Power among Firms in Sub-Saharan Africa: Do Institutions Matter in Competitive Policies?

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Abstract

In the context of a high prevalence of both poverty among households and business failures among firms in the majority of Sub-Saharan African (SSA) countries, competition is seen as one of the viable tools for transforming and improving these economies. This can be achieved by boosting productivity, improving output markets, increasing innovation and promoting economic growth. This study examines the sources of market power among firms within a variety of institutional settings using a large sample of data from 23 SSA countries. Tobit panel models comprising both fixed and random effects are used to estimate the determinants of market power. The study reveals that a large number of firms control less than 5 percent of the market with a few firms controlling between 5 and 34 percent of the market. At the same time, there are a small number of firms controlling between 30 and 100 percent of the markets in Sub-Saharan Africa. The findings further show that economic and political institutions significantly matter in the determination of power among firms in SSA. However, the influence of institutions varies significantly depending on the type of institutions and regional differences.

Keywords: Competition, institutions, firm, market power, Sub-Saharan Africa.

JEL Classifications: D41, K20, L22, L41, O55.

1. Introduction

Firms have for centuries been committed to activities geared towards increasing market power[1] by offering their buyers variety in the presence of competition. This favors consumers and is not seen as undesirable. However, the situation has changed in recent decades, as firms have tended to increase their profits through anti-competitive

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[1] Market power is the ability of a firm or group of firms to raise and maintain the price above the level that would prevail under a competitive market.

measures – colluding with rivals, blocking the entry of new firms and other actions that make consumers worse off.

As a consequence, countries have enacted laws and policies aimed at regulating market power and the concentration of firms for societal wellbeing. Despite that, the market power and concentration of firms have been growing rapidly not only in capitalist societies but also in developing economies, like in regions of Africa, Asia and Latin America.[2] According to the United Nations Conference on Trade and Development (UNCTAD) (2017), over the past two decades, market concentration increased steeply in terms of revenues, physical assets and other assets. Further, global mergers and acquisitions, a major factor affecting market power, have increased to $5 trillion in 2015, almost double the average of 21 percent between 2010 and 2014 (UNCTAD, 2017).

Sub-Saharan Africa (SSA) is not an exception to this growing phenomenon. The World Bank (2016) posits that the majority of SSA countries are perceived to have a lower level of competition compared to other regions of the world and this causes high business risks generated by price control, vested interests and a high level of favoritism. Along the same lines, the World Economic Forum (2015) notes that more than 70 percent of SSA countries ranked in the bottom half on the perceived intensity of local competition. This has resulted in the prevalence imperfect markets characterized by lack of competition (Diez, Leigh & Suchanan, 2018; Grau & Hockmann, 2017; Memanova & Mylonidis, 2019). This concern in SSA is largely overlooked but it is now resurfacing with various economic implications. Highly concentrated markets, if left unregulated and uncontrolled, can produce socially undesirable results such as higher prices and the survival of unproductive firms through blocking the entry of new firms (De Loecker & Van Biesebroeck, 2016; Golombek, Irarrazabal & Ma, 2018; UNCTAD, 2017). In addition, concern over increasing market concentration in the leading sectors of SSA countries is appropriate as it seems to have paved the way for rentier capitalism to the detriment of balanced and inclusive growth. The World Bank (2016) states that in the services sector, a single firm holds more than half the market share in over 50 percent of SSA countries. While some industries, such as power generating and transmission companies, railway companies and other utility providing industries may be *natural monopolies* (due to large fixed costs but very low marginal costs), there may still be the need for strong

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[2] The resulting harm of market power may extend beyond individual markets but would harm the economy as a whole in the form of slow economic growth, low productivity and increased inequality.

legislation and government regulations to control exploitative industries. The World Bank (2016) observes that Africa has much to gain by promoting competition through various institutions.

The study of market power and concentration of firms in SSA, especially in the services sector, has been largely overlooked in the literature. The objective of this study is to examine empirically how the institutional setting and government regulations among SSA countries affect market power and the concentration of firms.

The contribution of this study is threefold: Firstly, it serves as one of the few pieces of research in this area particularly for the developing countries of SSA. Secondly, the study applied a micro-econometric approach which proves to be more robust and efficient in firm-level analysis. Lastly, using detailed firm-level data, we are able to study the sources of market power using a different set of institutional variables across different sub-regions in SSA, which enable us to examine the sources of market power in a comparative manner.

The subsequent sections of this paper are organized in five sections: Section 2 provides a theoretical framework and a related review of literature. Section 3 and 4 discuss the methodology and results and discussions are given in sections 3 and 4 followed by conclusions and policy recommendations in the last section.

2.   Theoretical Consideration and Review of Related Literature

The underlying factors responsible for a decrease in competition and equivalent expansion in market power and monopolistic tendencies remain unclear in the economic literature.[3] It is well known that the absence of competition tends to make consumers worse off because of the reduction of quality, increase in prices, and blocking the entry of new firms. Further, monopolistic power in the labor market may lead to restrictions in employment and the lowering of wages below what is obtainable in a competitive market (Berger, Herkenhoff & Mongey, 2019; De Loecker & Eeckhout, 2018; Naidu, Posner & Wayl, 2018). It is a truism that competition brings uncountable benefits to consumers, workers, small businesses and other economic agents in a country (World Bank, 2016). These benefits can be achieved through the elimination of

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[3] While there is evidence that market power exists but surprisingly there is little or no evidence of the pattern of market power on the aggregate economy and the role of institutions in reducing monopolistic tendencies (De Loecker & Van Biesebroeck, 2017).

anti-competitive practices with sound legislation which, in most cases, are either absent or ineffective in most developing economies.[4] Government action can help to check market and encourage competition through anti-trust authorities and other relevant policies.[5]

Building on existing empirical and theoretical studies, there are many indices used in measuring market power and the concentration of firms in the literature. Some of these indices include a concentration ratio, which is mostly applied when there are large firms; the entropy index developed by Hart (1971); the Linda index; Horvath index developed by Horvath (1970); the Lerner index propounded by Lerner (1934); the Hirschman-Herfindhal index proposed by Herfindhal (1950) and Hirschman (1964), among others. Among all these indices, the Hirschman-Herfindhal index and concentration ratio have been the most widely used for the empirical analysis of market power.

Empirical studies specifically aimed at the effects of institutional policies and regulations on market power are extremely scarce. Most studies are skewed towards the effects of institutions on the firm's growth and in a broader sense on the general wellbeing of the economy (example include: Henrekson, 2005; Henrekson & Rosenberg, 2001; Klapper, Laeven & Rajan, 2006). There are a few empirical studies (like: Davidsson & Henrekson, 2002; Henrekson & Johansson, 1999; Memanova & Mylonidis, 2019) that provide insight on institutions that harmonize the activities of different actors with competencies which can bring about high economic growth and a competitive economy. Bresnahan (1989) finds that it is likely that institutional policies at the industry level will affect firm conduct and concentration. Formal institutions, both underlying and specific, provide the context and environment within which firms operate (Rodrik, 2008).[6]

Using panel data from U.S. airports, Bilotkash and Lakew (2014), analyze the sources of market power in the U.S. airline industry, and find that airport dominance is a more important source of market power than route dominance. Van Dender (2007) examines the relationship between airport level fares and concentration using 55 airports in the US and the

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[4] The benefits can be achieved even with a few or a single firm in the market provided there are credible threats of entry of new firms (Cabral, 2000; Dixit, 1980).

[5] However, it is paramount to know that consumers are not necessarily worse off when a firm's market power/market share increases as sometimes it may increase due to innovations which in turn increases the demand for the firm's products and services.

[6] Political, judicial and economic regulations and policies are important mechanisms for managing market power and firms concentration. Moreover, whether or not institutional policies are effective in regulating market power and firm's concentration to a large extent depends on their settings and efficacy.

results reveal an insignificant relationship between them. On the contrary, Borenstein, (1991) finds that an airline with a dominant position has greater market power. Also, Bilotskash (2007) establishes similar evidence that dominant firms control prices on international routes.

On the other hand, a substantial literature argues that competition among firms benefits consumers through lower prices (De Loecker & Van Biesebroeck, 2017; Kovacic & Shapiro, 2000; Memanova & Mylonidis, 2019). These benefits can also be greater product variety, quality and innovations which improve productivity and living standards (Aghion, Bloom & Blundell, 2005; Chen & Yu, 2018; Dunn & Shapiro, 2012; Memanova & Mylonidis, 2019). Market power is associated with lower economic growth, lower savings and investment and higher costs of financial intermediation (see Asongu, Nwachukwu & Tchamyou, 2016; Berger, Herkenhoff & Mongey, 2019; De Loecker & Eeckhout, 2018; De Loecker & Eeckhout, 2017; Morrison 1990; Naidu, Posner & Wayl, 2018).

Ciriani and Lebourges (2016) examine the effects of market power on economic growth and find that economic policies tend to limit the incentives and capabilities to invest in new technologies. Promoting competition goes beyond the enforcement of antitrust policies and laws; it is more appropriate when pro-competitive policies are enhanced.

Asongu, Le-roux and Tchamyou (2019) further stress that both consumers and producers can gain and lose depending on the circumstances. For instance, from the perspective of the consumer, market power is associated with efficiency because the consumer's marginal value is more than the market price. On the other hand, from the side of the producer, when the marginal cost of production is substantially lower than the supply price, the producer will make considerable gain. Navo (2001) investigates the extent to which firms exercise market power in ready-to-eat cereal industries and found that the demand and production approaches mainly agree on the mean level of mark-ups in the industry. Cruz-Garcia, de Guevara and Maudos (2017), in their analysis of market power, observe that the disparity in market power among banks in the Eurozone has decreased over time partly due to the convergence in average levels of market power and concentration.

Further, some research studies indicate that labor market power has contributed to wage inequality and economic stagnation (Berger, Herkenhoff & Mongey, 2019; Naidu, Posner & Weyl, 2018). This suggests that many labor markets around the world are not competitive but instead

exhibit considerable market power enjoyed by the employers, who use their market power to suppress wages.

Sylos-Labini (1967) find that the degree of competition or market power in any industry mainly depends on the barriers to entry of new firms, rather than the incumbent firm's size. Further, Cotterill (1986) find that the emergence of market power is mainly associated with technological factors rather than institutional factors. Vickers (2005) shows that the weakness of antitrust legislation in the US and parts of Europe has significantly contributed to the emergence of market power in recent decades. Asongu et. al, (2016) in their study of the role of information in reducing market power reveals that information-sharing offices completely neutralize the negative effect of market power on financial access. Other studies on market power and the banking industry show a strong positive correlation between foreign bank ownership and market power (Delis, Kokas & Ongena, 2016; Asongu & Odhiambo, 2019; Asongu & Biekpe, 2018; Akande, 2018). Egarius and Weill (2016) in their analysis of market power and switching costs in the banking industry using data for France, Germany and Italy, find a positive relationship between switching costs and market power. On the effect of mergers on market power, Kim and Singal (1993) found that prices increased for routes served by the merging firms relative to routes unaffected by the mergers. Liski and Montero (2011) show that a dominant firm tends to use its market power to increase prices. Hintermann (2011) shifts the focus away from exclusionary manipulation and show that a dominant firm with market power will manipulate prices for higher gains. Asker, Wexler and Loecker (2017) examine the effect of market power on the misallocation of resources in oil production. They found that there is substantial productive inefficiency due to market power.

The entry of new firms in the market is also found to have a significant effect on monopolistic power (Adebayo & Adeniji, 2018: Dafny, 2005; Goolsbee & Syverson, 2008; Seamans, 2012; Tenn & Wendling, 2014). It is important to note that the presence of many firms in a market does not guarantee competition. Sometimes firms collude to create market power (see Ajide, Bankefa & Ajisafe, 2018; Milgrom & Roberts, 1982). There is also evidence of increasing market concentration around the world. For example, Gaynor, Ho and Town (2015) reveal that between the early 1990s and 2006, the average Herfindahl-Hirschman Index (HHI) for hospitals increased by about 50 percent. In the same vein, Prater et al. (2012) found an increase in railroad market concentration between 1985 and 2007 in the US.

Generally, from the above survey of literature, it is clear that the question of the appropriate measures and sources of market power is not definitively answered and there are only a few studies that fully explore the nexus between institutions, monopolistic tendencies and market concentration – particularly for SSA countries. Thus, it is useful to look at the role of political, economic and legal institutions on monopolistic tendencies and the ability of firms to gain market power.

3. Methodology of the Study

3.1. Data Sources

The study used the Enterprise Panel Survey data sets by the World Bank (2017) for 23 Sub-Saharan Africa countries. The countries are selected based on the availability of data and are representative of the diversity of national incomes in SSA. The merged data set is an unbalanced panel with coverage ranging between 2003 and 2017 as described in appendix B. The Enterprise Survey is nationally representative of the various business establishments across the countries, involved mainly in manufacturing, retail and other services. Data was collected on firms' experiences and enterprises' perception of the environment in which they operate and focus on several factors that shape the business environment. These factors either constrain the firms' performance, or are viewed as *sine qua non* for the firms' prosperity. Data on economic institutions, institutionalized democracy and market size were sourced from the Index of Economic Freedom by The Heritage Foundation (2003-2017), Polity IV data set by the Centre for Systemic Peace (2003-2017) and World Development Indicators by the World Bank (2003-2017). The institutional variables are country average values reported by the data collection agencies.

3.2. Measures of Market Power

There are many measures of concentration propounded in industrial economics as highlighted in section 2. As a result, Pavic, Galetic and Piplica (2016) categorized them into two main groups. The first group is made up of measures that are easy to understand and simple to compute. The Concentration Ratio (CR) and Herfidahl-Hircschman Index (HHI) are the examples of this first group. In contrast, the second group is very complex and designed to serve particular purposes which include the Lerner index, Linda index, among others. This study used the first group's measures, particularly CR and HHI because they are easy to calculate, interpret and capture many aspects of market concentration. The CR is

computed by taking the proportion of output of the *k* biggest firms in the industry. The CR is calculated as:

$$CR_k = \sum_i^k S_i \qquad\qquad (1)$$

Where *k*=4, 8, 10, ……, 20, …… and S_i is the market share of the ith firm in descending order. The CR usually takes the four biggest firms (*k*=4) but if the total number of firms operating in the market is large, then an 8-firm or even 20-firm CR is used to assess the market concentration. The CR lies between 0 and 100 percent; 0 is a perfectly competitive case and 100 percent is seen as a monopoly situation. Although the measure is the simplest one, it has shortcomings like failing to indicate the presence or absence of potential entry and it does not measure local or regional market power. Thus, we also calculate the HHI index partly to complement the CR index and obtain a robust analysis of the subject matter. The group of measures, especially HHI, is also highly dynamic as it changes when there is new entry or exit into the market, and is a well-accepted indicator of competition (Brezina, Pekar, Ciˇckova & Reiff, 2016).

HHI is the sum of squares of the market shares of all firms in the industry or market. It is the most widely used measure of market concentration and has been widely applied in the United States to enforce anti-trust (competition) laws on firms (Bikker & Haff, 2002; Barthwal, 2010). Symbolically HHI is calculated as:

$$HHI = \sum_i^n S_i^2 \qquad\qquad (2)$$

Where $S_i=q_i/Q$, *q* is the sales of the ith firm, *Q* is total output of all firms in the market and *n* is the total number of firms. HHI lies between 0 and 1. It considers all firms and their relative sizes, and as such, it is popularly used. In this study, HHI is computed and used relative to industry, year and country. Generally, the choice of the CR and HHI indices is motivated by the fact that they are the most widely used approaches of measuring market power – especially when the market is characterised by a significant degree of market power and monopolistic tendencies (Kwoka, 1985).[7]

3.3. Model Specification and Estimation Technique

Generally, the sources of monopoly power among firms are numerous. Mankiw (2012) and Reynolds (2011) note that market power

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[7] For details see Gaynor, Ho & Town (2015).

comes from the following sources: natural monopoly through unique sources of raw materials, large sunk costs, market size, government ownership and legislation. Thus, the baseline model for this study could be specified as in equation 3:

$$mktpower_{it} = f(rmat_{it}, mktsize_{it}, govown_{it}, cost_{it}, age_{it}) \qquad (3)$$

Where *mktpower* is the market power, *rmat* is the expenditure on raw materials as a proportion of sales, *govown*, the "government ownership," *cost* is a vector of costs of production (capital and labor) and *age* is the years of the firm's operation. Equation (3) could be modified to capture other variables as in equation 4:

$$mktpower_{it} = \delta_0 + \delta_1 age_{it} + \delta_2 cost_{it} + \delta_3 rmat_{it} + \delta_4 mktsize_{it} + \\ \delta_5 govown_{it} + \delta_7 inst_{it} + \mu_{it} \qquad (4)$$

where *exprt* is a dummy for the firm's exports, and *inst* is a vector of economic, legal and political institutions. μ is the error term and *it* represents firm *i* in time *t*. The choice of these control variables is consistent with the recent market power literature (Chen & Yu, 2018; Diez, Leigh & Suchanan, 2018; Grau & Hockmann, 2018; Memanova & Mylonidis, 2019).

This study applied a Tobit panel regression model to estimate the determinants of market power in Sub-Saharan Africa. The model is selected because it is the most suitable when there is either left- or right-censoring in the dependent variable (also known as censoring from below and above, respectively). Besides, the model is also chosen because HHI is truncated between 0 and 1 while CR lies between 0 and 100 percent. The Random effects Tobit model is estimated given the inconsistency of the fixed effects Tobit estimator as observed by Cameron and Trivedi (2005). The model is specified in equation 5:

$$mktpower_{it}^* = \beta_0 + \beta_n x_{it} + v_{it} + \mu_{it} \qquad (5)$$

Where *mktpower$_i$*=0 if *mktpower$_i^*$*$\leq$0 and mktpower$_i$ = *mktpower$_i^*$* if mktpower$_i^* > 0$, x_{it} is a vector of explanatory variables and v_{it} is a random effect and μ_{it} is an error term of the ith firm in time t.

4. Results and Discussions

Appendix A reports the definitions of the variables used in the analysis while Appendix B contains the descriptive statistics of the variables. Appendix C lists the countries and years of survey. Appendix D presents

partial correlations between measures of market power and explanatory variables and the results show that there is significant correlation with the exception of market size, which is only moderately correlated with the HHI index. This means that the possibility of reverse causality between the variables is very low. Table 1 reports the distribution of market power among firms based on their types, sub-regions and sizes. The table reveals that the manufacturing, retail and service firms hold sizeable shares of their respective markets, which are all less than 0.50 or 50 percent. Specifically, the average HHI of manufacturing firms is just 0.11, which is far lower than those of retail and services firms of 0.23 and 0.21 respectively. However, there are still a few manufacturing, retail and service firms that control more than 80 percent of the markets. This can affect the efficiency of markets due to a significant probability of monopolistic behavior (see Akande, 2018). Again, when the firms were further disaggregated (using the CR), it is observed that the four biggest manufacturing, retail and service firms hold sizeable shares of their respective markets. But then again, there are some firms among the four biggest manufacturing firms that hold about 97 percent of the market. This means that there is a strong element of high market concentration, possibly by way of collusion or cartelization among the firms (see Chen & Yu, 2018).

Table 1 suggests further that, in terms of average HHI, firms from all regions hold a moderate share of the markets of less than 0.02 or 2 percent, with Central African firms holding the largest average share of 0.01 or 1 percent. Conversely, Western Africa has a few firms controlling up to 34 percent of the markets. To confirm this, the firms in the regions were also disaggregated; it is again found that the average market share held by the four biggest firms in the regions is less than 40 percent. Yet, some of the biggest firms hold about 100 percent of some markets in Eastern and Western Africa. This is in conformity with the result obtained by Adebayo and Adeniji (2018). It implies that some markets in Eastern, Central and Western Africa are highly monopolized, which could be due to a weak institutional framework. On the other hand, market power is lower in Southern Africa, and this may be the result of relatively strong institutions in the region. This finding is in line with the results obtained by Roberts (2004) and Sitko, Burke and Jayne (2018) in their studies on market power and competition in southern Africa.

Additionally, the average market shares (using HHI) held by micro, small, medium and large firms are also modest because the average shares are below 0.02 or 2 percent of the market. Nevertheless, some of the micro, small, medium and large firms control up to 34 percent of their respective markets.

Table 1: Distribution of Market Power in Sub-Saharan Africa

Firm-Type	Distribution		Average Market Share		Minimum Market Share		Maximum Market Share	
	Frequency	Percentage	HHI	CR (%)	HHI	CR (%)	HHI	CR (%)
By Firm-Type								
Manufacturing	10,915	48.34	0.004	38.75	0.001	16.05	0.03	97.44
Retail	5,294	23.45	0.01	35.76	0.001	19.64	0.34	42.48
Service	6,370	28.21	0.01	36.50	0.001	13.28	0.04	46.20
By Region								
Eastern Africa	9,016	26.87	0.005	39.33	0.002	19.64	0.02	100
Central Africa	2,604	7.76	0.01	38.64	0.01	37.01	0.02	40.74
Southern Africa	1,961	5.84	0.005	38.99	0.002	37.01	0.04	40.74
Western Africa	19,970	59.52	0.004	37.82	0.0002	8.64	0.34	100
By Firm-Size								
Micro	266	0.95	0.01	37.01	0.001	0	0.08	37.01
Small	17,421	61.89	0.004	38.85	0.0002	8.64	0.34	100
Medium	7,752	27.54	0.004	37.01	0.0002	8.64	0.34	100
Large	2,708	9.62	0.01	40.74	0.0002	8.64	0.08	97.44
Total	-	-	0.01	38.20	0.0002	8.64	0.34	100

Source: Authors' Calculations using World Bank Enterprise Survey Datasets.

When the CR is considered, the four biggest firms among micro, small, medium and large firms hold significant shares of their markets of about 41 percent and the four biggest firms hold between 97 and 100 percent of the markets. This is strong evidence for the existence of monopolies which also threatens social welfare and efficiency of markets.

Table 1 and Figure 1 depict that a large number of the firms control less than 0.2 or 20 percent of the markets with a few firms holding between 20 and 60 percent of the markets. But there are a small number of firms holding between 70 and 99 percent of the markets in Sub-Saharan Africa.

Figure 1: Market Power Base on Herfidahl-Hircschman Index (HHI)

Figure 1: Market Power Base on Herfidahl-Hircschman Index (HHI)

Source: Authors' Calculations.

This signals the presence of monopolies in the region. The monopolies may have taken advantage of the high cost of doing business in the region to occupy the markets. This provides support for the findings of studies by Chen and Yu (2018), Adebayo and Adeniji (2018) and Akande (2018).

Figure 2: Market Power Based on Concentration Ratio (CR) in SSA

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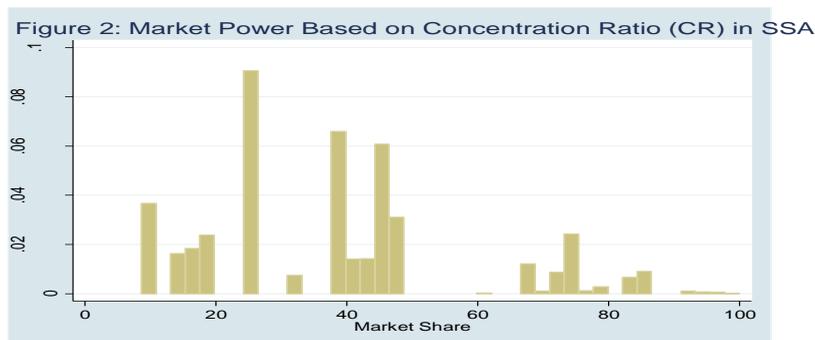
Source: Authors' Calculations.

Figure 2 shows that the four biggest firms in SSA control between 10 and 50 percent of the markets with the four biggest firms holding the equivalent of 70-100 percent of the markets. This is a typical case of collusion, which is detrimental to competition in SSA as argued by Roberts (2004) and Sitko, Burke and Jayne (2018).

Table 2 reports Panel Tobit regression models on sources of market power in SSA using HHI consisting of an unconditional[8] fixed effect, random-effect and pooled Tobit regression models. The coefficients of both the fixed-effect and random-effect Tobit models appear to be almost the same in terms of signs, size and significance. This implies that we cannot reject the random-effect Tobit regression model. Again, the rho estimate of the random-effect model suggests that the panel-level variance component is important, and the panel estimator is different from the pooled estimator. This means the random-effect Tobit model is appropriate here. In Table 2, the results of the random effects model indicate that only institutionalized democracy matters in determining the market power of

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[8] An unconditional fixed-effect Tobit regression model is estimated due to the lack of the formal process of estimating the conditional one. Following Zambrano (2005), we fitted the fixed-effect Tobit model by estimating linear Tobit with the time-variant factor since there many firms (33,551) and including the cross-sectional units to capture firm-level effects would create a problem. However, this estimation does not also give room for estimating the Hausman test.

firms in SSA and it seems to have increased market dominance of firms in the region by about 0.004 percent, and this may not be unconnected with political patronage and lobbyists' activities.

Additionally, the random effects model in Table 2 incorporates interaction terms and the results imply that when democracy becomes more institutionalized and firm size increases simultaneously, the market power of the firms decreases and this may be due to competition. This is so because many newer firms might have grown strong enough to compete both legitimately and illegitimately with the existing ones. Further, the results show that as democracy becomes more institutionalized and firm exports increase, then such firms tend to dominate the market. This, of course, could be linked to the expansion of the political networks of such firms and the possibility of engaging in collusive activity at both the local and international markets. Among the controls in the random-effect Tobit model, significant variables include age, cost of labor, firm size, domestic market size, imported raw materials as a proportion of sales and a more expansive market-size variable created through the interaction between domestic market size and exporting status.

Table 2: Sources of Herfidahl-Hircschman-Index-Based Market Power in SSA

Variables	Unc. FE Tobit	RE Tobit	Pooled Tobit
Age	-1.65e-05***	-1.65e-05***	-2.48e-05***
	(4.00e-06)	(4.00e-06)	(4.46e-06)
Lab cost (log)	0.000280***	0.000281***	8.66e-05***
	(2.91e-05)	(2.91e-05)	(2.99e-05)
Phy capital (log)	5.15e-05	5.17e-05	0.000122***
	(3.15e-05)	(3.15e-05)	(3.55e-05)
Firm size	-0.00078***	-0.00078***	-0.000673**
	(0.000249)	(0.000249)	(0.000279)
Sales' Prop. of Imported r/w	6.56e-06***	6.62e-06***	2.14e-05***
	(2.03e-06)	(2.03e-06)	(2.27e-06)
Exporting status	0.00948***	0.00950***	0.0164***
	(0.00297)	(0.00297)	(0.00334)
Domestic Market size	-0.00204***	-0.00204***	-0.00221***
	(8.24e-05)	(8.24e-05)	(6.80e-05)
Govt ownership	-0.000364	-0.000364	-0.000253
	(0.000351)	(0.000351)	(0.000394)
Domestic Priv. Own	-0.000104	-0.000103	-0.000367*
	(0.000174)	(0.000174)	(0.000195)
Econ inst.	2.51e-05	2.50e-05	-6.97e-05***
	(1.64e-05)	(1.64e-05)	(1.79e-05)
Court sys fairness	-1.43e-05	-1.47e-05	-0.000228***
	(5.66e-05)	(5.67e-05)	(6.30e-05)
Inst. Democ.	4.04e-05***	4.04e-05***	3.42e-05***
	(7.98e-06)	(7.98e-06)	(8.54e-06)
Market size * exporting status	-0.00059***	-0.00059***	-0.000989***
	(0.000169)	(0.000169)	(0.000190)
Econ inst. * firm size	3.79e-06	3.81e-06	6.42e-06
	(4.54e-06)	(4.54e-06)	(5.10e-06)
Econ inst. * exporting status	-1.76e-06	-1.76e-06	-1.77e-06
	(2.93e-06)	(2.93e-06)	(3.31e-06)
Inst. Democ. * exporting status	3.88e-05*	3.87e-05*	3.03e-05
	(2.10e-05)	(2.10e-05)	(2.37e-05)
Inst. Democ.* firm size	-0.00024***	-0.00024***	-0.000180***
	(5.78e-05)	(5.79e-05)	(6.37e-05)
Southern Africa	-0.00275***	-0.00275***	-0.00295***
	(0.000214)	(0.000214)	(0.000193)
Eastern Africa	-0.000576	-0.000570	-0.00200***
	(0.000363)	(0.000363)	(0.000331)
Western Africa	-0.00081***	-0.0008***	-0.000565***
	(0.000247)	(0.000247)	(0.000214)
Constant	0.0741***	0.0442***	0.0484***
	(0.00188)	(0.00385)	(0.00161)
Sigma u		0.0114***	
		(0.00244)	
Sigma e	0.00616***	0.00616***	0.00696***
	(3.78e-05)	(3.78e-05)	(4.27e-05)
Rho		0.7744***	
		(0.0748)	
Time-Variant Factor	X	-	-
Observations	13,295	13,295	13,295
Number of year	11	11	11

Source: Authors' Calculations.

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

In particular, the model shows that as the firm ages, market power decreases by 0.002 percent meaning that the age of the firms in SSA does not increase market power. This may be due to lack of dynamism and competitiveness of the firms in SSA that adhere to a given strategy of doing business because of low technological development. Domestic market size is also observed to have a negative effect on market power in SSA, that is, as domestic market size expands a firm's market power reduces by 0.204 percent. This implies that a large market makes it less likely for any firm to strive to occupy the market. In order to see the effect of market size across exporting and non-exporting firms, an interaction term of market size and exporting status was created, which shows that market size generally reduces the market power of firms by an additional 0.057 percent when they are exporters.

Furthermore, exporting firms tend to have greater market power, by 0.95 percent, which could be due to high competitive advantage and access to more opportunities than non-exporting firms in SSA. Imported raw materials as a proportion of sales positively affect the firms' market power, which indicates that an increase in the proportion of imported raw materials leads to rise in market power by 0.001 percent. The ability to import (unique) raw materials gives such firms a competitive edge, and may result in greater market power. It is also shown in Table 2 that as the size of the firms increases, the tendency toward market power decreases by 0.078 percent, which could also be linked to improvement in competition as more firms are able to compete with the existing market leaders. As the labor cost goes up, the firms' market power also increases and this is so because the high cost of doing business may discourage some firms from producing goods and services. Finally, firms from Southern, Eastern and Western Africa have less market power than those from Central Africa.

Table 3 reports Panel Tobit regression models on sources of market power in SSA using the Concentration Ratio of the four biggest firms consisting of unconditional fixed-effect, random-effect and pooled Tobit regression models. Again, the unconditional fixed-effect Tobit regression model is estimated due to lack of a formal process of estimating the conditional one.

Table 3: Sources of Concentration Ratio-based Market Power in SSA

Variables	Unc. FE Tobit	RE Tobit	Pooled Tobit
Age	0.0151***	0.0151***	0.00980***
	(0.00225)	(0.00225)	(0.00264)
Lab cost (log)	0.0939***	0.0929***	-0.191***
	(0.0163)	(0.0163)	(0.0176)
Phy capital (log)	0.0483***	0.0482***	0.0536**
	(0.0177)	(0.0177)	(0.0210)
Firm size	0.805***	0.807***	1.231***
	(0.139)	(0.139)	(0.164)
Sales' Prop. of Imported r/w	-0.00841***	-0.00843***	-0.00733***
	(0.00115)	(0.00115)	(0.00135)
Exporting status	0.527	0.535	6.208***
	(1.683)	(1.684)	(1.995)
Domestic Market size	0.959***	0.959***	0.557***
	(0.0478)	(0.0478)	(0.0408)
Govt ownership	-0.206	-0.207	-0.446*
	(0.197)	(0.197)	(0.233)
Domestic Priv. Own	0.615***	0.615***	0.616***
	(0.0976)	(0.0977)	(0.116)
Econ inst.	0.0335***	0.0337***	0.0717***
	(0.00916)	(0.00916)	(0.0106)
Court sys fairness	0.136***	0.136***	-0.0857**
	(0.0319)	(0.0319)	(0.0374)
Inst. Democ.	0.0320***	0.0319***	-0.00345
	(0.00446)	(0.00446)	(0.00502)
Market size * exporting status	-0.0177	-0.0183	-0.380***
	(0.0958)	(0.0959)	(0.114)
Econ inst.* firm size	-0.0157***	-0.0157***	-0.0177***
	(0.00253)	(0.00254)	(0.00300)
Econ inst. * exporting status	0.00208	0.00207	-9.43e-05
	(0.00164)	(0.00164)	(0.00195)
Inst. Democ.* exporting status	-0.00969	-0.00957	0.0169
	(0.0118)	(0.0118)	(0.0140)
Inst. Democ.*firm size	0.0974***	0.0968***	-0.0661*
	(0.0336)	(0.0336)	(0.0391)
Southern Africa	-0.194	-0.197	-1.212***
	(0.124)	(0.124)	(0.117)
Eastern Africa	6.535***	6.518***	-0.364*
	(0.205)	(0.205)	(0.198)
Western Africa	4.717***	4.702***	0.0271
	(0.142)	(0.142)	(0.130)
Constant	13.19***	15.20***	26.42***
	(1.072)	(1.303)	(0.962)
Sigma u		2.817***	
		(0.604)	
Sigma e	3.436***	3.437***	4.094***
	(0.0212)	(0.0212)	(0.0253)
Rho		0.4018*** (0.1031)	
Time-Variant Factor	X	-	-
Observations	13,097	13,097	13,097
Number of year	11	11	11

Source: Authors' Calculations.
Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

The results of the unconditional fixed-effect and random-effect Tobit regression models, show that the models produce the same results in terms of sign, size and significance. This implies that the unconditional fixed-effect Tobit regression model is neither more efficient nor more consistent than the random effect model and vice versa. Given the significance of rho, it could be stated that the panel-level variance component is important and the panel estimator is different from the pooled estimator. Thus, random effect estimates could be considered appropriate here.

In Table 3, it is observed that in the random-effect Tobit model, economic institutions, a fair court system and institutionalized democracy positively affect the market power of the four biggest firms, which implies that the firms may have co-opted these institutions. But if the quality of economic institutions and size of firms increase jointly, then the market power held by the four biggest firms reduces by 1.57 percent. This indicates that as both economic institution and other firms become stronger, competition improves in SSA. However, as democracy becomes more institutionalized and the size of firms goes up concurrently, market power of the four firms is found to increase by 9.74 percent. This could be also related to improved competition which compels the biggest to lobby political office holders so as to maintain their dominance of the market in the region.

The random-effect Tobit model of Table 3 also shows that expansion in the size of the domestic market increases the market power of the four biggest firms. This is clear as market leaders always seek to take advantage of any increase in the quantity demanded for products in their industries in order to maintain and sustain their leadership in the market. The model reveals further that sales' share of imported raw materials negatively affects the firms' market power, which implies that upswing in the sales' share of imported raw materials causes a decrease in market share of the four biggest firms by 0.843 percent. This could be due to the high cost of importing raw materials which thereby reduce the competitive advantage of the biggest firms. However, the model shows that labor cost has a positive and significant effect on the market share of the four biggest firms as it increases their market share by 9.39 percent, which may be due to economies of scale.

As firms become more experienced (represented by an increase in age) and physical capital increases, the market power of the four biggest firms goes up by 1.51 and 4.83 percent respectively. Similarly, an increase in the size of firms and being domestic and privately-owned raises the

market power held by the four biggest firms in the region. Finally, the market power held by the four biggest firms is higher in Eastern and Western Africa than that of Central Africa.

To check the robustness of our findings, we estimated the standard linear fixed effect, the random effect and pooled regression models. The results of the robust test of HHI models are presented in Table 4 and the findings of the standard linear fixed effect model are similar to those of the fixed and random effect Tobit regression models reported in Table 2. The Hausman test was conducted and the result implies that the standard linear fixed effect model is more efficient or appropriate than the random effect model. Therefore, this corroborates the reliability of our findings in the tables. Further, the findings of ordinary random effect and pooled regression models in Table 4 are similar to each other and to those of the pooled Tobit regression model of Table 2. The rho result in Table 2 confirms that the findings of fixed- and random-effect Tobit regression models are consistent with each other.

Also, the findings of the standard linear random effect and pooled regression models in Table 5 are similar to each other and to those of the pooled Tobit regression model of Table 3. And the insignificance of the Breusch and Pagan Langrangian Multiplier Test shows that the random effect is not important, which means the random effect panel estimator in this case is different from the pooled estimator. However, the rho result in Table 3 shows otherwise, and this still confirms that the findings of fixed and random-effect Tobit regression models are consistent with each other.

Table 4: Robustness Check of HHI Models

Variables	HHI Robust		
	FE	RE	Pooled
Age	-1.65e-05***	-2.48e-05***	-2.48e-05***
	(4.01e-06)	(4.46e-06)	(4.46e-06)
Lab cost (log)	0.000280***	8.66e-05***	8.66e-05***
	(2.92e-05)	(3.00e-05)	(3.00e-05)
Phy capital (log)	5.15e-05	0.000122***	0.000122***
	(3.15e-05)	(3.55e-05)	(3.55e-05)
Firm size	-0.000778***	-0.000673**	-0.000673**
	(0.000250)	(0.000279)	(0.000279)
Sales' Prop. of Imported r/w	6.56e-06***	2.14e-05***	2.14e-05***
	(2.03e-06)	(2.27e-06)	(2.27e-06)
Exporting status	0.00948***	0.0164***	0.0164***
	(0.00298)	(0.00335)	(0.00335)
Domestic Market size	-0.00204***	-0.00221***	-0.00221***
	(8.25e-05)	(6.80e-05)	(6.80e-05)
Govt ownership	-0.000364	-0.000253	-0.000253
	(0.000351)	(0.000395)	(0.000395)
Domestic Priv. Own	-0.000104	-0.000367*	-0.000367*
	(0.000174)	(0.000195)	(0.000195)
Econ inst.	2.51e-05	-6.97e-05***	-6.97e-05***
	(1.64e-05)	(1.80e-05)	(1.80e-05)
Court sys fairness	-1.43e-05	-0.000228***	-0.000228***
	(5.67e-05)	(6.30e-05)	(6.30e-05)
Inst. Democ.	4.04e-05***	3.42e-05***	3.42e-05***
	(7.99e-06)	(8.54e-06)	(8.54e-06)
Market size * exporting status	-0.000592***	-0.000989***	-0.000989***
	(0.000169)	(0.000191)	(0.000191)
Econ inst. * firm size	3.79e-06	6.42e-06	6.42e-06
	(4.55e-06)	(5.10e-06)	(5.10e-06)
Econ inst. * exporting status	-1.76e-06	-1.77e-06	-1.77e-06
	(2.93e-06)	(3.31e-06)	(3.31e-06)
Inst. Democ.. * exporting status	3.88e-05*	3.03e-05	3.03e-05
	(2.11e-05)	(2.37e-05)	(2.37e-05)
Inst. Democ..* firm size	-0.000236***	-0.000180***	-0.000180***
	(5.79e-05)	(6.37e-05)	(6.37e-05)
Southern Africa	-0.000576	-0.00200***	-0.00200***
	(0.000363)	(0.000331)	(0.000331)
Eastern Africa	-0.00275***	-0.00295***	-0.00295***
	(0.000214)	(0.000193)	(0.000193)
Western Africa	-0.000806***	-0.000565***	-0.000565***
	(0.000248)	(0.000215)	(0.000215)
Constant	0.0385***	0.0484***	0.0484***
	(0.00172)	(0.00162)	(0.00162)
Observations	13,295	13,295	13,295
Number of year	11	11	
Hausman Test	2046.58 [0.0000]****		
Breusch and Pagan LM Test		0.0000[1.0000]	

Source: Authors' Calculations.
Notes: Standard errors in parentheses, probability values in [ ], *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Robustness Check of CR Models

Variables	FE	RE	Pooled
Age	0.0151***	0.00980***	0.00980***
	(0.00225)	(0.00264)	(0.00264)
Lab cost (log)	0.0939***	-0.191***	-0.191***
	(0.0163)	(0.0177)	(0.0177)
Phy capital (log)	0.0483***	0.0536**	0.0536**
	(0.0177)	(0.0210)	(0.0210)
Firm size	0.805***	1.231***	1.231***
	(0.139)	(0.164)	(0.164)
Sales' Prop. of Imported r/w	-0.00841***	-0.00733***	-0.00733***
	(0.00115)	(0.00135)	(0.00135)
Exporting status	0.527	6.208***	6.208***
	(1.685)	(1.997)	(1.997)
Domestic Market size	0.959***	0.557***	0.557***
	(0.0479)	(0.0409)	(0.0409)
Govt ownership	-0.206	-0.446*	-0.446*
	(0.197)	(0.233)	(0.233)
Domestic Priv. Own	0.615***	0.616***	0.616***
	(0.0978)	(0.116)	(0.116)
Econ inst.	0.0335***	0.0717***	0.0717***
	(0.00917)	(0.0106)	(0.0106)
Court sys fairness	0.136***	-0.0857**	-0.0857**
	(0.0320)	(0.0374)	(0.0374)
Inst. Democ.	0.0320***	-0.00345	-0.00345
	(0.00446)	(0.00502)	(0.00502)
Market size * exporting status	-0.0177	-0.380***	-0.380***
	(0.0959)	(0.114)	(0.114)
Econ inst. * firm size	-0.0157***	-0.0177***	-0.0177***
	(0.00254)	(0.00300)	(0.00300)
Econ inst. * exporting status	0.00208	-9.43e-05	-9.43e-05
	(0.00164)	(0.00195)	(0.00195)
Inst. Democ.. * exporting status	-0.00969	0.0169	0.0169
	(0.0118)	(0.0140)	(0.0140)
Inst. Democ..* firm size	0.0974***	-0.0661*	-0.0661*
	(0.0336)	(0.0391)	(0.0391)
Southern Africa	6.535***	-0.364*	-0.364*
	(0.206)	(0.198)	(0.198)
Eastern Africa	-0.194	-1.212***	-1.212***
	(0.125)	(0.117)	(0.117)
Western Africa	4.717***	0.0271	0.0271
	(0.142)	(0.130)	(0.130)
Constant	15.00***	26.42***	26.42***
	(0.988)	(0.962)	(0.962)
Observations	13,097	13,097	13,097
Number of year	11	11	
Hausman Test	5770.83 [0.0000]***		
Breusch and Pagan LM Test		0.0000[1.0000]	

Source: Authors' Calculations.
Notes: Standard errors in parentheses, probability values in [ ], *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Generally, the findings signify that institutions significantly matter in determining market power among firms in SSA. However, the influence of institutions vary greatly depending on the circumstances. When all

firms are considered in the analysis, the impacts of institutions are found to fairly meet theoretical expectations. However, institutionalized democracy is found to be encouraging firms to dominate the market, which could be related to political patronage and lobbyist activities of some firms during and after elections.However, as democracy becomes more institutionalized and there is greater growth of firms, there is less chance of firms dominating the market (see Memanova & Mylonidis, 2019). This is of course the combined effect of highly institutionalized democracy and increased competitive capability of many firms.

Conversely, the findings show that the four biggest firms exploited the weak institutions to dominate the industries in the region which may be through lobbyist and collusive activities, and unsubstantiated innovation and invention[9]. Again, the results show that as economic institutions become stronger and firms grow simultaneously bigger, there is a smaller possibility of the four biggest firms dominating the market. This could be linked to the fact that many firms have grown adequately to compete with the biggest firms and at the same time economic institutions guarantee an enabled 'playing field' for all the firms in the region through freedom of property rights, investment, monetary accessibility and fiscal freedom, which together encourage the entry of new firms into many industries or markets. Thus, the entry of new firms reduces the market power of the existing firms. It is noteworthy that market size has a significant impact on market power. Therefore, with large markets firms do not concern themselves too much to dominate the market.

5. Conclusion and Policy Recommendations

This paper examines the sources of market power among firms in SSA. To actualize this objective, a firm-level unbalanced panel dataset (Enterprise Surveys) by the World Bank was used and analysed using a random-effects Tobit regression model. The study finds that a significant number of firms hold less than 20 percent of the markets with a few firms holding between 20 and 60 percent of the markets. But there are a small number of firms holding between 70 and 99 percent of the markets in SSA. When high institutionalized democracy is supported by the growth of firms, then market power is reduced. Conversely, when high institutionalized democracy is supported by high exports, the market power held by some firms increases and this could be said to support the findings of Adebayo and Adeniji (2018).

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[9] Patent right is usually granted to firms that innovate and/or invent.

Other factors determining the firms' market power in SSA countries include domestic market size, age of firms, labor costs, exporting capacity, proportion of imported raw materials, overall market size, and regional effects. Labor costs, proportion of imported raw materials and exporting status positively affect market power, while the size of firms, domestic market size, overall market size, age of firms, and regional factors (due to lack of or weak competition policies) negative significant impact market power as established by Vickers (2005).

Similarly, the study established that economic, legal and political institutions encourage the four biggest firms to dominate their respective industries as they collude or form a cartel to collectively innovate or invent in their respective areas of businesses – which paves the way for them to gain market power easily. The study also found that as economic institutions become stronger and firms also grow, market domination by the four biggest firms is curtailed, perhaps through easy entry of the new firms into the markets – which can be explained as a clear case of weak legal and political institutions that do not properly regulate cartel or collusive activities in the markets. Also, the four biggest firms from Eastern and Western Africa dominate their markets more than those from Central and Southern Africa. This also confirms the finding of Vickers (2005), Adebayo and Adeniji (2018).

In line with the above findings, the study recommends some measures to improve the institutional framework in SSA. First, it is necessary to introduce legislations of competition in the region through constitutional amendments – particularly in Western Africa where there is evidence of weak institutions. Second, specific strong competitive policies on collusion, cartel, merger and acquisition should also be introduced in all countries such as the ones in South Africa, Togo and Kenya (Economic Commission of Africa, ECA, 2000). Third, there needs to be greater penalties for uncompetitive practices thereby serving as a deterrence. Fourth, competition commissions (such as the Zambian Competition Commission) ought to be introduced across all countries as an executive unit to monitor, control and prohibit acts or behavior which could adversely affect competition in the countries. Finally, in order to effectively implement the policies, there is a need to consider reducing the cost of doing business through infrastructural development.

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Appendix

Appendix A: Description of Variables

Variable	Definition
Dependent	
Market Power	Measured by Herfidahl-Hircschman Index (HHI) and Concentration Ratio (CR) computed using firms' sales
Explanatory	
Age	The number of years a firm has been in operation (natural logarithm)
Firm size	Logarithmic of total number of firms' permanent and full-time employees
Domestic Ownership	Dummy for the dominance of domestic private ownership of the firms
Government	Dummy for the firms or portion of firms owned by owned government
Market Size	Logarithm of country's population
Exporting status	Dummy for firms that export their output
Imported Raw Materials	Expenditure on imported raw materials as a proportion of sales
Economic Institutions	Measured by the countries' average economic freedom index
Legal Institution	Measured by a dummy for fairness of court system whereby 1 for strongly disagree, 2 for tend to disagree, 3 for tend agree and, 4 for strongly agree that the court system is fair, impartial and uncorrupted.
Institutionalized Democracy	Measured an index of how institutionalized a country's democracy is. The index ranges from 0 for completely weak to 10 for perfectly strong political institution
Central Africa	Dummy for firms operating in Central Africa
Eastern Africa	Dummy for firms operating in Eastern Africa
Western Africa	Dummy for firms operating in Western Africa
Southern Africa	Dummy for firms operating in Southern Africa

Source: Authors' Calculations

Appendix B: Descriptive Statistics

Variables	Observation	Mean	Standard Dev	Min	Max
Overall					
Concentration R	31,045	38.37553	14.31501	8.636711	100
HHI	33,551	.0045534	.0068221	.0001599	.3366609
Age	32,597	19.1433	13.37347	0	168
Lab Cost (log)	17,778	15.03359	2.797457	6.907755	25.80839
Phy Cap (log)	29,759	14.69501	3.153637	0	27.01484
Firm size	33,167	2.686643	1.25106	0	11.06664
Imported r/m	32,545	22.90073	26.83659	0	100
Exporting status	33,509	.0864842	.281082	0	1
Market size	33,551	17.75324	1.139574	13.07792	18.99435
Govt. Own	33,550	.0208048	.1427324	0	1
Dom Priv Own	33,027	.9201865	.2710083	0	1
Econ Institution	33,551	54.67886	6.823078	22.1	68.5
Court Sys Fairn	28,814	2.395641	1.017183	1	4
Inst. Democ.	33,551	3.243957	10.40677	-77	10
Eastern Africa	33,551	.2687252	.4433033	0	1
Central Africa	33,551	.0776132	.2675659	0	1
Southern Africa	33,551	.0584483	.2345928	0	1
Western Africa	33,551	.5952133	.490858	0	1
Central Africa					
Concentr Ratio	2,397	38.63603	1.081977	37.01178	40.7422
HHI	2,604	.0087635	.002906	.0045563	.016073
Age	2,526	17.78424	12.28528	0	114
Lab Cost (log)	2,378	15.38401	2.482742	8.411833	25.35141
Phy Cap (log)	2,547	14.5137	1.915485	2.995732	23.94214
Firm size	2,590	2.754355	1.153462	0	8.517193
Imported r/m	2,602	27.53412	27.29746	0	100
Export status	2,604	.0837174	.2770167	0	1
Market size	2,604	17.24982	.5887074	16.73552	18.09983
Govt. Own	2,604	.0280338	.1651011	0	1
Dom Priv Own	2,588	.8531685	.3540063	0	1
Econ Institution	2,604	46.78568	5.872152	39.6	54.6
Court Sys Fairn	2,456	1.939739	.9421303	1	4
Inst. Democ.	2,604	3.006528	2.191459	1	6
Eastern Africa					
Concentr Ratio	9,016	39.33413	7.840897	19.64077	100
HHI	9,016	.0051703	.0032809	.0015468	.0173102
Age	8,576	20.27624	16.30653	0	133
Lab Cost (log)	6,821	15.13496	2.993181	6.907755	25.12999
Phy Cap (log)	8,419	14.69095	2.118266	0	25.82861
Firm size	8,829	3.010988	1.318202	0	10.30895
Imported r/m	8,755	26.72147	27.60933	0	100
Export status	8,995	.1136187	.3173652	0	1
Dome mk size	9,016	17.23844	.704514	16.03808	18.41457
Govt. Own	9,015	.014975	.1214596	0	1
Dom Priv Own	8,769	.9054624	.2925918	0	1

Overall					
Variables	**Observation**	**Mean**	**Standard Dev**	**Min**	**Max**
Econ Institution	9,016	53.46977	10.24213	22.1	63.9
Court Sys Fairn	7,854	2.406799	.9556095	1	4
Inst. Democ.	9,016	3.682786	2.843969	0	9
Southern Africa					
Concentr Ratio	1,358	38.99267	.6588058	37.01178	40.7422
HHI	1,961	.0047724	.0058747	.0014934	.0361381
Age	1,956	26.48262	19.91925	2	149
Lab Cost (log)	1,885	14.29894	2.302975	6.907755	21.69329
Phy Cap (log)	1,664	13.99374	1.990115	4.382027	22.51503
Firm size	1,947	3.606962	1.65519	0	11.06664
Imported r/m	1,961	22.75144	28.89438	0	100
Export status	1,954	.1596725	.3663958	0	1
Dome mk size	1,961	17.20656	1.127029	14.50385	17.70496
Govt. Own	1,961	.0081591	.0899814	0	1
Dom Priv Own	1,946	.8766701	.3289	0	1
Econ Institution	1,961	64.08419	6.368682	49.7	68.5
Court Sys Fairn	1,314	2.429224	.9001641	1	4
Inst. Democ.	1,961	8.922998	.2666619	8	9
Western Africa					
Concentr Ratio	18,274	37.82254	17.79956	8.636711	100
HHI	19,970	.0037044	.0081018	.0001599	.3366609
Age	19,539	18.08701	10.73136	0	168
Lab Cost (log)	6,694	15.01269	2.787106	6.907755	25.80839
Phy Cap (log)	17,129	14.33413	1.661739	0	27.01484
Firm size	19,801	2.442672	1.101548	0	8.723882
Imported r/m	19,227	20.54914	25.90379	0	100
Export status	19,956	.0674484	.2508032	0	1
Dome mk size	19,970	18.10498	1.217427	13.07792	18.99435
Govt. Own	19,970	.0237356	.1522281	0	1
Dom Priv Own	19,724	.9398195	.237827	0	1
Econ Institution	19,970	55.3304	2.118205	48.7	61.3
Court Sys Fairn	17,190	2.453112	1.046582	1	4
Inst. Democ.	19,970	2.519129	13.18656	-77	10

Source: Authors' Calculations

Appendix C: Countries in the Panel Dataset

Countries	Sub-Region	Years of Panel Surveys
Angola	Central Africa	2006, 2010
Benin	Western Africa	2005, 2009
Burkina Faso	Western Africa	2006, 2009, 2016
Cameroon	Central Africa	2006, 2009, 2016
Cape Verde	Western Africa	2006, 2009
Coted Ivoire	Western Africa	2009, 2016
Democratic Republic of Congo (DRC)	Central Africa	2010, 2013
Ethiopia	Eastern Africa	2011, 2015
Ghana	Western Africa	2007, 2013
Kenya	Eastern Africa	2007, 2013
Lesotho	Southern Africa	2009, 2016
Malawi	Eastern Africa	2009, 2014
Mali	Western Africa	2003, 2007, 2010
Niger	Western Africa	2005, 2009, 2017
Nigeria	Western Africa	2007, 2009, 2014
Rwanda	Eastern Africa	2006, 2011
Senegal	Western Africa	2003, 2007
South Africa	Southern Africa	2003, 2007
Tanzania	Eastern Africa	2006, 2013
Togo	Western Africa	2009, 2016
Uganda	Eastern Africa	2006, 2013
Zambia	Eastern Africa	2007, 2013
Zimbabwe	Eastern Africa	2011, 2016

Source: Authors' Calculations

Appendix D: Parts of Pairwise Correlation for Possibility of Causality

	HHI	CR
HHI	1.000	
CR	-0.0004	1.0000
Age	-0.0206	-0.0541
Lab cost (log)	0.0796	-0.0333
Phy capital (log)	0.0919	-0.0055
Firm size	0.0379	0.0609
Sales' Prop. of Imported r/w	0.2278	-0.0611
Exporting status	0.0456	0.0385
Domestic Market size	-0.5330	-0.0352
Govt ownership	-0.0051	0.0072
Domestic Priv. Own	-0.1079	-0.0014
Econ inst.	-0.0528	-0.0008
Court sys fairness	-0.0581	0.0014
Inst. Democ.	-0.0044	-0.0026
Central Africa	0.1790	0.0053
Eastern Africa	0.0548	0.0428
Southern Africa	0.0080	0.0092
Western Africa	-0.1509	-0.0462

Source: Authors' Calculations