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THE CURSE OF PARTY MONOPOLY

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ABSTRACT

Africa's economic performance has been widely viewed with pessimism. In this paper, we use firm-level data for 89 countries to examine formal firm performance. Without controls, manufacturing African firms do not perform much worse than firms in other regions. But they do have structural problems, exhibiting much lower export intensity and investment rates. Once we control for geography and the political and business environment, formal African firms robustly lead in sales growth, total factor productivity levels and productivity growth. Africa's conditional advantage is higher in low-tech than in high-tech manufacturing, and exists in manufacturing but not in services. While geography, infrastructure, and access to finance play an important role in explaining Africa's disadvantage in firm performance, the key factor is party monopoly. The longer a single political party remains in power, the lower are firm productivity levels, growth rates, and sales growth for manufacturing. In contrast, the business environment and firm characteristics (except for foreign investment) do not matter as much. We also find evidence that the effects of the political and business environment are heterogeneous across sectors and firms of various levels of technology.

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I. Introduction

In the 1960s, Africa's economic growth was similar to South Asia (Collier and Gunning 1999a). However, between 1970 and 2000, the average GDP per capita growth rate was only 0.5 percent per annum, and sub-Saharan Africa is now the poorest continent.² In the decade before the recent financial crisis, however, the continent experienced a resurgence in growth. Growth in GDP for the continent averaged 5.9 percent annually (World Economic Forum 2009). Is this trend sustainable? How can Africa keep growing? What are the key policies that facilitate Africa's economic performance?

This paper sheds light on these questions using micro data. We use the most recent surveys of the World Bank's Enterprise Survey for 89 countries. We combine these surveys with other cross-country datasets on politics, macro policies, geography and the business environment, to study the determinants of performance of formal manufacturing firms. Our goal is to explore the key factors behind Africa's disadvantage, if any, relative to other regions.³ We focus in particular on African firm performance relative to firms in countries from other continents with GDP per capita below 3000 U.S. dollars (see Table 2). We look at a comprehensive set of firm performance outcomes, including static efficiency, dynamic efficiency, export shares, and investment rates.

Our paper adds to the literature explaining Africa's economic performance (see Collier and Gunning 1999a, 1999b; Bigsten and Soderbom 2006). There are many previous studies examining one aspect of firm performance (such as investment rates, sales growth, exports, or

² The numbers are based on World Development Indicators of the World Bank.

³ In the rest of this paper, we use SSA and Africa interchangeably. Africa does not include the North Africa region in this paper. It is important to keep in mind that all firms in the World Bank Enterprise Survey that we use consist of formal firms. In a few African countries, informal firms were also surveyed, but the number of countries is too small to merit a full scale cross-country firm-level study.

productivity), often using one or several African countries' firm-level data. However, there is no study, as far as we know, that examines all these key determinants of African development at the firm level, with both large African and non-African firm samples. We aim to be comprehensive in including potential explanatory variables: firm characteristics, geography, infrastructure, access to finance, political and institutional factors, and (other) aspects of the business environment (including labor flexibility, corruption, international competition, domestic competition, and crime).⁴ In light of the limited financial and administrative capacity of reformers and policy makers—capacity that is especially constrained in Africa—it is important to identify the key constraints to growth (Hausman et al. 2005).

Our broad focus on firm performance thus differentiates our paper from the existing studies of African firms, which tend to focus on a single outcome at a time and miss important aspects of how African firms behave and perform. Without controlling for firm characteristics or the business environment, we find that formal African manufacturing firms have a slight disadvantage in labor productivity but a slight advantage in total factor productivity (TFP) levels, similar sales growth, but a significant disadvantage in labor productivity growth, export orientation and investment rates. Once we control for infrastructure, the political and business environment, African firms *lead* in productivity levels, growth rates, and sales growth. We interpret the positive premium for African firms, after controlling for the political and business environment, as suggesting that there is no inherent African disadvantage.

Taken at face value, if one could adjust the daunting list of geographic, infrastructure, political and institutional factors, the business environment and access to finance, then African firms possess an intrinsic advantage. For export intensity and investment rates, the Africa

⁴ See Xu 2011 for a survey of this growing literature.

dummy is insignificant. Whatever makes African firms lag behind can thus be explained by observable differences in the environment.

We then break down the differences between African and other firms to identify the key observables that explain constraints on performance. While geography, infrastructure, and access to finance prove to be important in explaining Africa's disadvantage in firm performance relative to better-performing similar income countries, the most important factor is party monopoly. For manufacturing firms, the longer a single political party remains in power, the lower are firm productivity levels and growth rates, and these adverse effects are especially severe in countries with higher informality. In contrast, the business environment (such as corruption, domestic and international competition), firm characteristics (except foreign ownership), ethnic fractionalization, and being landlocked do not matter as much. Other factors that also play a lesser role include property rights protection, infrastructure, and access to finance.

This paper also adds to the literature on the effects of the (broadly-defined) business environment. We obtain several novel findings: (i) political monopoly is negatively and robustly associated with productivity levels, growth rates and firm expansion; (ii) trade credit plays an important role in developing countries; and (iii) high crime rates lower productivity growth and deter firm expansion and exports. Moreover, the institutional and business environments have heterogeneous effects across firms in different sectors. For instance, relative to low-tech manufacturing, high-tech manufacturing depends more on telecommunications and market size, and its growth rate is also more sensitive to firing costs.

In each of the 89 countries of the World Bank Enterprise Survey (WBES) included in this paper, firms of all sizes and ownerships are covered for both manufacturing and services industries. The survey questions are broad, including detailed quantitative measures which allow

us to infer firm performance such as labor productivity levels and growth rates, TFP, sales growth, investment rates and export intensity. Moreover, the survey asks detailed questions, both subjective and objective, on the political, institutional, and business environment that a firm faces, such as infrastructure issues, regulatory burdens, corruption, crime, and access to finance. To produce comprehensive measures of the business environment, we supplement the WBES data with cross-country data on the political and business environment: telecommunications, infrastructure quality, the transportation costs of exporting, the incidence of domestic conflicts, and political competition.

We address the potential endogeneity of the business environment in several ways.⁵ First, we mainly rely on objective measures of the business environment. Subjective answers may be based on firms' performance directly, and may be determined by country-specific factors such as exposure to the media and development history. Second, we do not directly use firms' answers on the business environment. Instead, we rely on city-industry-size average of firms' answers to gauge the local business environment. This local measure is less subject to the reverse causality issue associated with firm-level answers, and may proxy for the actual business environment well. Finally, with the local business environment on the right-hand side, there may be local-level omitted variables that are closely correlated with our explanatory variables. To check for this possibility, we control for additional local and country-level determinants of firm outcomes, and show that our key results remain robust. However, with observational data, it remains true that endogeneity issues—especially in the context of a horse race between various alternative explanations—can never be ignored. This is especially true when many conventional instruments proposed for a particular variable (such as institutions) are often correlated with

⁵ See also Dollar et al. 2006, Aterido et al. forthcoming; Xu 2011

other channels in the residual of the performance equation (Bazzi and Clemens 2010; Morck and Yeung 2011). We thus resort to as many robustness checks as possible, and offer a coherent story to tie various findings together (Rosenbaum 2010). We offer a menu of facts and explanations, and we invite readers to offer alternative explanations for what we find here.

II. Data and Measurement

The main data sources for this paper are the World Bank's Enterprise Surveys (WBES) in 89 countries. The WBES data are collected by the World Bank to benchmark the investment climate in developing countries across the world and to understand the determinants of firm performance and behavior. In each country the survey was based on the universe of eligible firms obtained from the country's statistical office with stratified random sampling with replacement, and the result is a representative sample of the non-agricultural private economy in the country.⁶ Stratification was based on three criteria: the sector of activity, firm size, and geographic location.⁷

For each country in the sample, we use the most recent survey available. Consequently, this paper focuses on explaining cross-country differences in firm performance, but by controlling for industry effects we will focus on differences within specific industries. With our primary focus on the manufacturing sector, we will mainly use the manufacturing sample of around 12000 firms. The number of countries in sub-Saharan Africa is 33 (see the Appendix for the list of the SSA countries). Typically the stratified sampling yields 100 to 1000 firms per country.

⁶ Thus wholly state-owned firms are not in the sample.

⁷ See Ayyagari, Demirguc-Kunt, and Maksimovic (2011) for more detailed description of the WBES.

The WBES includes questions on various aspects of the business environment, including infrastructure, regulation burdens, corruption, and access to finance. The availability of these indicators about the business environment allows us to simultaneously control for various aspects of the business environment. The survey has both objective and subjective measures of the business environment. In general we rely on objective measures to avoid endogeneity of firm responses. We avoid using the so-called subjective measures, which record a firm's perceived obstacles to doing business. Only for questions related to crime do we use the subjective measures due to its importance in less developed countries and the lack of alternative data sources.

For indicators of the business environment from WBES, we do not directly use individual answers because we believe they are endogenous. We thus use the local average of the business environment as a proxy for the local business environment (Dollar et al. 2005; Hallward-Dreimeier et al. 2006; Aterido et al. forthcoming; Xu 2011). In particular, we opt to rely on a city-industry-size cell as the basic unit for measuring the local business environment. In computing the mean for a firm, the observation for the firm itself is excluded to avoid endogeneity. The business environment has been shown to differ vastly across regions (Almeida and Carneiro 2009; Hallward-Dreimeier and Pritchett 2010; Xu 2011) so we allow for a city-specific dimension. The literature also suggests that firms of various sizes face different business environments. In particular, small firms are particularly vulnerable to expropriation (Beck et al. 2005; Cull and Xu 2005), so we allow the business environment to differ by size. To

implement the empirical strategy, we define a firm to be small (large) if the firm has fewer (more) number of employees than the median-sized firm of the city-industry cell.⁸

We also rely on cross-country data to capture important elements of the business and political environment that the Enterprise Survey does not measure, including elements such as geography, infrastructure, political and institutional environment, and macroeconomic policies. Aiming to be comprehensive, we combine measures of the business environment of WBES with other measures of the political, institutional and business environment at the country level. We describe below how we measure our key variables.

Infrastructure. We use four measures to capture the quality of infrastructure. Two measures capture the extent of modern communication infrastructure: telephone density (from WDI indicators), and the local (i.e., city-industry-size) share of firms using websites for their businesses (based on WBES). The third measure is the general infrastructure index from the Logistics Performance Index of the World Bank (Arvis et al. 2010), which measures the general quality of infrastructure covering areas including ports, roads, railroads and information technology. The final measure is the transport cost to export a standard container in US Dollars (from Doing Business), which captures the soundness of infrastructure devoted to the integration of the international market. These four measures thus capture basic infrastructure facilitating domestic and international trade.⁹

Since telephone density and local web intensity are closely correlated, and they both measure the use of modern telecommunication, we rely on factor analysis to obtain their

⁸ When the city-industry-size cell has fewer than 5 observations, we replace the cell mean with the city-industry mean as a proxy of the local business environment.

⁹ One omission in our measure of infrastructure is the lack of road network data. While WDI has data on paved roads, the data are very unreliable. For instance, India is said to have longer road network than China, a possibility that is instantly dismissed for anyone who has travelled to both countries. The WDI road data simply do not capture the quality of road well. In contrast, the measures we adopt here make more sense in our judgment.

principal factor, and call it Telecom. Once holding Telecom constant, the general infrastructure index then measures the quality of general infrastructure apart from the telecom component.

Geography has been suggested as an important reason for Africa's lack of development (Collier and Gunning 1999; Sachs and Warner 1997). In particular, Africa has more landlocked countries, which heightens the need for coordination with neighboring countries. Given the significantly higher trade costs associated with borders, being landlocked necessarily impedes international trade. Another somewhat subtle aspect of geography for Africa is its small population in general. The low fertility of land and other aspects of geography imply that African countries tend to have sparsely populated land. To capture the geographic elements above, we thus rely on (1) a dummy variable for whether a country is landlocked and (2) domestic market size, as proxied by country population. We also explore in robustness tests the importance of natural resource endowments, such as the share of land in tropical areas.

Political and institutional factors. This category includes three political and institutional factors that might influence firm performance. The first is *ethnic fractionalization*, a key feature that affects many formal and informal institutions in Africa (Easterly and Levine 1997). Ethnic fractionalization has been suggested as an important explanation for poor African performance (see Collier and Gunning (1999) and Easterly and Levine (1997)).

The second component is basic property rights protection. Cross-country evidence suggests that countries with worse property rights have lower aggregate investments, worse access to finance, and slower economic growth (North 1990; Knack and Keefer 1995; Acemoglu, Johnson and Robinson 2001). Acemoglu and Johnson (2005) find evidence that property rights institutions (i.e., those related to government expropriation) tend to be more important than contracting institutions (e.g., those safeguarding private transactions). Some new firm-level

evidence also points to the importance of property rights (Johnson, McMillan and Woodruff 2002; Cull and Xu 2005) and the adverse effects of corruption. Potential mechanisms for the property rights effects include better external finance (Demirguc-Kunt and Maksimovic 1998), better asset allocation (Claessens and Laeven 2003), and a higher share of large formal firms (Demirguc-Kunt et al. 2006). To capture the protection of property rights, we rely on political competition, in particular, the number of years that the ruling party has been in power from the Data of Political Institutions (DPI, based on Beck et al. 2001 and Keefer 2007). Our reasoning is that the longer a ruling party has been in power, the more absolute power the ruling party has, and the higher the risk of unconstrained government expropriation.¹⁰ There are clearly alternative explanation for this party monopoly variable. For instance, a ruling party with monopoly power may behave like “stationary bandits” in contrast to “roving bandits”, and therefore internalize the benefits of providing a good business environment and property rights protection so that the party has a sustained economic payoff over the long run (Olsen 2000). This stationary bandit interpretation of party monopoly thus implies a positive effect on economic performance rather than the negative effect predicted by the expropriation-risk interpretation. We shall thus allow the empirical results to distinguish these two opposite interpretations.

In later sensitivity checks, we also include alternative measures of protection of property rights, including voice and accountability, executive competition, and government size. While

¹⁰ This intuition seems to capture the reality of most developing countries well. However, some argue that several East-Asian countries also have low political competition as measured by this variable but seem to have performed well in the past several decades. Gehlbach and Keefer (2010a, 2010b) suggests that this may be due to much better ruling party institutionalization in East Asian countries relative to other countries. Institutionalized ruling parties facilitate development in autocratic countries for two main reasons. First, they tend to have broad party bases so that the party represents broad rather than narrow constituent interest. Second, there are institutionalized rules about removing incompetent or shirking party-leading rulers. Thus the party can credibly commit to remove bad leaders, and leaders as a result work hard and perform well.

the first two measures are clearly related to the protection of property rights of citizens from government expropriation, the size of government captures the de facto power of government, and could be viewed as de facto protection of property rights.¹¹

The third component of political and institutional factors is whether a country experienced any armed domestic conflicts in the previous ten years. This variable is related to the political structure of a country (Acemoglu and Robinson 2012). In countries with no strong centralized power, any small army can rob and take from others and try to obtain power, and armed conflicts are likely. In countries with unconstrained political power, armed conflicts may develop as challengers attempt to grab power from incumbents by violence. To capture basic domestic safety, we use a dummy variable on whether domestic armed conflicts occurred in the past 10 years, based on Gleditsch et al. (2002) and updates of UCDP/PRIO (2010).

Business environment. The first element of business environment that we measure is the extent of corruption. We use the WBES measure of corruption which is the local average of bribes to the government normalized by firm sales. This is directly comparable across countries, and avoids some of the flaws of subjective perceptions of corruption. Previous research has shown that firms in developing countries (such as Uganda and China) are hurt more by corruption than by taxation (Fisman and Svensson 2007; Cai, Fang and Xu 2011). Since we have very few measures of crime across countries, we use one subjective measure from the dataset: firms were asked the extent to which they view crime as an obstacle to their expansion.

¹¹ There are alternative interpretations for government size, but here we just mean to use it as a sensitivity check, and the key conclusions do not hinge on our classification.

We thus construct a variable called *Obstacle_crime*, which is the local share of firms that view crime as a moderate or major constraint.¹²

The second element of the business environment that we measure is labor market flexibility. Some recent studies suggest that stringent labor regulations can have serious adverse effects (Xu 2011). For instance, cumbersome labor regulations are associated with smaller firm size, more informality and higher unemployment in India and Brazil (Amin 2009a, Almeida and Carneiro 2009; Li, Mengistae and Xu 2011). Minimum wages in Indonesia were found to have large negative effects on employment (Harrison and Scorse 2010). Labor market flexibility is proxied by an index of the difficulty of firing workers at the county level (*Firing Difficulty* hereafter) (Botero et al. 2004). Firing Difficulty is an index measuring the cost of firing 20 percent of a standardized firm's workers (10% are fired for redundancy and 10% without cause). The cost of firing a worker is calculated as the sum of severance pay and any mandatory penalties established by law or mandatory collective agreements for a worker with three years of tenure with the firm.

The third element of the business environment captures product market competition. Given the multifaceted nature of product market competition, we employ several measures to capture this. The first is the country-industry-year import tariff, a high level of which means lower international competition for domestic producers. Related, a larger presence of foreign firms also represents stronger competition (see Aitken and Harrison 1999). Foreign firms in developing countries tend to be more productive, as shown later in this paper. The third measure captures domestic country-industry level competition ("*Competition_ind*"), as measured by $(1 - \text{markup}_{CI})$ (Aghion et al. 2005). Markup_{CI} is the country-industry average of firm-level markup

¹² The data set also has the share of sales lost due to theft and vandalism during transportation. For manageability of table length, we do not include this variable in our list of explanatory variables.

(i.e., (value added – labor costs)/sales). A higher value of Competition_ind implies more competition. Fourth, in sensitivity checks, we also include a subjective measure of informal competition as well as the effect of entry barriers, proxied by the minimum capital required (% of income per capita) for starting a business (from Doing Business data set). A higher ratio implies higher entry barriers and less competition.

Access to finance. There is a large literature on the linkages between access to finance and economic development (see Levine 1997). While most of this literature focuses on access to formal finance such as bank loans and overdraft facilities, there is a growing literature that examines the impact of access to informal finance (Cull and Xu 2005). Following this literature, we include access to both formal and informal finance, and investigate whether they have different effects on firm performance. Access to formal finance is measured as the city-industry-size share of firms with access to overdraft facilities, as in Dollar et al. (2005), and access to informal finance is measured as the city-industry-size share of firms that grant trade credit (to other firms).¹³

III. How does Africa stack up against other countries?

To examine African manufacturing performance, we include both static and dynamic measures of performance. We compare both total factor productivity (TFP) and labor productivity (in logs). Labor productivity is measured as sales (in constant 2005 U.S. dollars) divided by the number of employees. TFP is derived from estimating an industry-income-

¹³ We have also tried using the local share of firms *receiving* trade credit. These two variables are, not surprisingly, very closely correlated. This fact, coupled with the fact that the latter measure has significantly fewer observations, leads us to use the former trade credit measure in our empirical analysis.

specific production function and measured as the residual from such a production function.¹⁴ We classify countries into four income levels based on GDP per capita quartiles and allow both industry and income specific coefficients on the input coefficients used to derive constant dollar TFP.

To see Africa's dynamic momentum, we also examine African firms' sales growth and investment rates. For sales growth, we use growth during a three-year period since we only have data going back for three years at the firm level. Following Davis and Haltiwanger (1995), we compute sales growth rates as (sales this year – sales three years ago)/average. In robustness checks, we also examine labor productivity growth, again using the Davis-Haltiwanger formula. To measure the exposure of African firms to global markets, we also compare firm-level export intensity, defined as the share of exports in total sales.

We exclude from our SSA sample the richest four countries: South Africa, Botswana, Mauritius and Namibia, which have GDP per capita higher than 3000 US dollars (in 2005 value). The countries in our new African sample consist of all SSA sample countries that have GDP per capita lower than 3000 U.S. dollars (in 2005 value) at the time of each country's survey.

¹⁴ We proceed as follows. We classify all countries into 4 categories of income levels based on the quartiles of GDP per capita. We allow for income-category-industry specific coefficients for capital and labor for the value added production function. We also include income-category-industry dummies to capture common income-category-industry productivity. Our key results are robust with respect to alternative ways to measure TFP (see later discussions).

Capital is measured as replacement value of capital stock. This is the only feasible measure of capital we can obtain from the data. It is perhaps useful to point out that our TFP measure is likely less reliable than the other performance measures. To measure capital reliably in any country is a daunting task, and to measure it consistently and reliably in 89 countries with differences in accounting systems and survey implementation is even more challenging. The questionnaire designs tend to be the same across countries, but there are minor differences across countries and regions. Indeed, when we examine capital-labor ratio for manufacturing firms, the numbers are often surprising. In terms of median firms, Africa's capital-labor ratio is about 78% of that of non-Africa. In terms of the 90th percentile, the corresponding ratio is 107%. But in terms of the 95 percentile, the ratio becomes 653%, and in terms of the 99 percentile, the ratio exceeds 1000%. So Africa has many more outliers in capital intensity—due either to measurement errors or to systematic distortion in capital allocation.

However, in later sensitivity checks, we show that our key conclusions about Africa do not hinge on whether we keep or drop these four successful SSA countries.

Evaluating African economic performance necessarily entails comparing Africa with other countries. We thus construct two comparison groups for Africa. The first, *the average comparison group*, consists of countries in non-SSA countries with per capita GDP lower than 3000 U.S. dollars (in 2005 value). The second, *the better comparison group*, consists of the top half countries of the average comparison group in terms of performance. We measure country performance in the following way. We first standardize each of the five performance measures so that each now has a mean of zero and a standard deviation of 1. We then add up the five standardized measures to form an aggregate performance measure. Countries whose mean aggregate performance ranks in the top half of the average comparison group are defined to be members of the better comparison group.

Mean Differences across African and non-African firms

African manufacturing firms are 3 to 5 years younger than the two comparison groups. They have slightly lower state ownership but significantly higher foreign ownership, by 6 (3) percentage points relative to the average (better) comparison group. They show higher ownership concentration, with the largest owner claiming 82 percent of firm ownership, higher than the average (better) comparison group by 8 (11) percentage points. African manufacturing firms are much smaller, with the log number of employees lower than the average (better) comparison groups by 70 (102) log points.

Geography in Africa is characterized by a higher tendency to be landlocked and a smaller domestic market. Africa is slightly more likely to be landlocked than the average comparison group (but this difference is statistically insignificant), but significantly more likely to be landlocked than the better comparison group (25 versus 14 percent). African countries also have smaller populations, with the population of the average country lower by 60 (133) log points than those in the average (better) comparison group. Furthermore, African countries (excluding the top four richest countries) still have much lower average GDP per capita at \$488, about 1000 dollars lower than the average and the better comparison groups.

Africa displays stronger political monopoly—the logarithm of the number of years that the ruling party in an African country has been in power is greater by 46 (15) log points than the average (better) comparison group. In addition, African firms have to confront violence and crime to a greater extent. In terms of the incidence of major or minor domestic conflicts in the previous 10 years, Africa has a higher tendency than the average comparison group (50 versus 41 percent). Surprisingly, the better-performing group actually has a higher past history of domestic conflicts (53 percent). Relatedly, Africa exhibits the highest level of ethnic diversity. The ethnic fractionalization (or diversity) in Africa, at 0.716, is much higher than the average (better) comparison group by 0.316 (0.369).

Infrastructure in Africa is significantly worse, an outcome expected in light of its low income level. In particular, both the telecom index and the general infrastructure index are much lower in Africa than the two comparison groups. The transportation costs of exporting a standard container is also significantly higher for Africa: about 10% (25%) higher than the average (better) comparison groups.

The overall business environment clearly is worse in Africa than both comparison groups. To begin with, African firms have to pay higher bribes to get things done.¹⁵ African firms' average share of bribes to the government as a share of sales at 2.9 percent, is significantly higher than the average comparison group by 1.3 percentage points, and higher than the better comparison group by 1.8 percentage points. While the subjective perception of crime as a moderate or severe obstacle is similar for Africa and similar income countries, the better comparison group reports significantly lower perceived crime. Africa also exhibits lower labor flexibility, with higher firing costs than in both comparison groups. African firms also face less competition, both domestically and internationally. The average industry-level tariff rate in Africa, for instance, is about 60% higher than both comparison groups. The country-industry level index of competition is also significantly lower in Africa than in both comparison groups. In contrast, competition from the informal sector does impose more threats than elsewhere. While 69 percent of African firms view competition from the informal sector as important, only around 40 percent of firms in the two comparison groups share this view.

African firms also have worse access to finance, both formal and informal. The local average share of firms with overdraft facilities is 23 percent, 22 (12) percentage points lower than the average (better) comparison group. Note that the better comparison group actually has lower access to formal finance than the average comparison group, suggesting that access to formal finance is perhaps not crucial for firm performance for countries at low income levels. Equally important, African firms also have less access to trade credit: the local share of firms granting trade credit is 27 percent, which is 27 percentage points lower than the average comparison group, and 30 percentage points lower than the better comparison group. Note the

¹⁵ This is very similar to the fact that firms in the poorer regions in China tend to spend more on entertainment costs (for government officials) in China (Cai et al. 2011).

rank order of trade credit prevalence corresponds to the order of firm performance, which suggests that trade credit may play an important role in explaining regional economic performance, a conjecture confirmed later.

To summarize, African firms face a more daunting business environment in almost all respects. They operate in poorer, smaller economies that are more likely to be landlocked and they have inherited a history of armed conflict. Infrastructure is poorer, access to both trade credit and other forms of credit is lower, and regulatory barriers in the form of labor market regulations and other types of regulations are higher. Political monopoly is more significant, tariffs are higher, and the payment of bribes is also higher. For exporters, costs are significantly higher, with container fees 10 to 25 percent higher than elsewhere. Only the firm characteristics in our sample play a positive role, as the African firms in the sample are on average younger, and more likely to have foreign equity participation.

Differences in (unconditional) firm performance

In this section, we report our comparison of the unconditional means for different measures of firm performance, including labor productivity, total factor productivity (TFP), sales growth, exports and investment. Later in the paper, we will report the “conditional” performance for African firms, after controlling for observable characteristics of the environment. Given the much more difficult environment faced by African firms as described above, we would expect poorer performance on the part of African firms in the unconditional means.

For the average comparison group, Africa manufacturing firms have worse outcomes for five out of our six performance measures. Log labor productivity in Africa is lower by 5.4 log points (statistically significant). Labor productivity growth is lower by 8.3 percent. Sales growth is slightly lower but statistically insignificant. Export share is lower by 8.6 percentage points

(statistically significant), with African firms exporting at only half the level of exports for the average comparison group. Qualitatively consistent with a number of previous studies (Bisten et al. 1999, Gimah-Brempong and Traynor 1999, Devarajan et al. 1999),¹⁶ investment intensity in Africa is lower by 4.1 percentage points (11.8 versus 14.9 percent), about three quarters of the level of the average comparison group. However, TFP in Africa is significantly higher than the average comparison group by 48 log points.

The difference with the better comparison group is more pronounced. The labor productivity lag is at 29 log points, and labor productivity growth lag is 8.4 percent. While the sales growth difference remains insignificant, the export share is significantly lower by 13.8 percentage points, and the investment rate is significantly lower by 10 percentage points. To summarize, relative to similar-income countries and the better comparison group, growth and productivity levels of formal manufacturing firms in African countries are slightly behind, productivity growth is significantly worse, and African firms exhibit much lower export capacity and investment levels.

Determinants of firm performance (conditional differences)

We now investigate how the business environment affects firm performance, and explore how African firms compare when we control for the external environment. The empirical specification is as follows:

$$Y_{icj} = Firm_i\alpha + Geography_c\beta_1 + infrastructure_{cj}\beta_2 + PoliInst_c\beta_3 + busiEnvi_{cj}\beta_3 + finance_{cj}\beta_4 + INDUSTRY + \varepsilon_{icj} \quad (1)$$

¹⁶ There is inconclusive evidence about whether investment in Africa is efficient. Devarajan et al. (1999) argue for inefficiency based largely on cross-country data, while Gunning and Mengistae (2001) argue for efficiency based on firm-level African data.

where Y is the firm performance indicator, and i , c , and j represent firm, country, and local levels. Y could be log labor productivity (or TFP), the rate of sales growth, export intensity, or the investment rate.¹⁷ *Firm* is a set of basic firm-level controls including firm age, state and foreign ownership, and the ownership share of the largest owner. For the sales growth rate equation we control for initial level (i.e., sales three years ago) to allow for regression toward the mean.¹⁸ *Geography* includes log country population and a dummy equal to one for landlocked countries. *Infrastructure* includes the infrastructure index, the logarithm of the transportation costs of shipping a standard container to the nearest port, and the telecom index (measured at the local, that is, the city-industry-size, level). *PoliInst* represents the category of political and institutional factors, and includes log party years, any conflict in the past ten years, and ethnic fractionalization. *BusiEnvi* indicates business environment consisting of average country-industry foreign ownership, firing difficulty, the local average bribe, country-industry tariff levels, country-industry competition index, and the average perceived level of crime at the local level. *Finance* includes the local share of firms having access to an overdraft facility, and the local average for access to trade credit. We also include industry dummies, so that comparisons are between firms within the same sectors across countries. The error term captures unobserved variables and measurement errors.¹⁹ Since the error terms within a country may be correlated

¹⁷ Log labor productivity is trimmed of tail one percent to avoid the outlier issue. Results are similar without trimming. In a later check, we also examine labor productivity growth as another measure of firm performance.

¹⁸ For labor productivity (i.e. log of sales over the number of employees), export share (i.e., export/sales) and investment rate (i.e., investment/value added), we have tried including log of the denominator to capture the scale effects. For export share and investment rate, we have tried controlling for log of the number of employees to allow for difference in behavior associated with firm size. In the end, the results are reasonably similar to without including these controls. However, since our key objective is to measure the total effect of the several key categories of policy/environmental variables, and $\ln(L)$, $\ln(\text{value added})$, $\ln(\text{sales})$ could capture the intermediate effects and are thus endogenous, we decided to leave these controls out of our specification.

¹⁹ Since we have many control variables, and the coverage of both Enterprise Survey and cross-country sources differ for some countries, dropping the observations with any variable missing would result in the loss of the majority of the sample, and render our empirical exercises much less representative. For variables with significant number of missing observations, we thus resort to imputation, using the predicted value based on the following basic controls: the country-level urbanization level, the regional dummies (Africa, East Asia and Pacific, East Europe and

due to omitted common factors or shocks, and many of our explanatory variables are aggregate variables, we cluster the standard errors of each equation at the country level (Moulton 1990). We also report White standard errors to allow for heteroskedasticity.

As discussed earlier, to avoid endogeneity associated with some of the business-environment variables which could be choice variables for firms—such as telecom use, bribery, and access to overdraft facilities—we use city-industry-size average of these variables as proxies for the local business environment. Since omitted local variables are still a possibility, we include other local-level variables as well. However, the results remain subject to the possibility of omitted variable bias due to the omission of other local-level variables or reverse causality.

The base results from equation (1) are reported in Table 4. Once we control for firm characteristics and the business environment, the coefficient on the Africa dummy is positive and large for TFP (126 log points), for labor productivity (212 log points), and sales growth (23 percent). Thus conditional on our key variables, Africa does not lag behind in productivity and growth—in fact it is ahead of other regions. Taken at face value, if one could adjust the daunting list of geography, infrastructure, political and institutional factors, the business environment and access to finance to the levels elsewhere, Africa possesses an inherent advantage (i.e., the African dummy variable).²⁰ For export intensity and investment rates, the Africa dummy is insignificant. Whatever makes African firms lag behind can thus be fully explained by our control variables.

Central Asia, South Asia, Middle East and North Africa), the manufacturing dummy, and firm size dummies (10-20, 20-60, and 60+ employees). Why do we use the manufacturing dummy in imputation when our analysis largely focuses on the manufacturing subsample? While we largely use the manufacturing subsample for most of analysis, we do use the service subsample in some sensitivity checks.

²⁰ In this paper we do not have a measure of the extent of clustering. Previous literature suggests that clustering may be important for explaining firm performance (see Long and Zhang 2011).

Firm characteristics matter a great deal in explaining firm performance. *First*, younger firms tend to have lower labor productivity but not TFP. The positive correlation between age and labor productivity is consistent with the conjecture that entrants learn in the initial years (Sleuwaegen and Goedhuys 2002). Younger firms also have higher growth rates and investment rates. Entry therefore proves to be important for growth. *Second*, and maybe surprisingly, state ownership is positively and significantly associated with TFP, labor productivity, sales growth, and export share in value added. This is surprising in light of the large literature that suggests that private ownership is superior in delivering firm performance (see Megginson and Netter (2001) for a summary). But other evidence suggests that state owned enterprises could outperform private enterprises when there is sufficient competition (Bartel and Harrison (2005)) or no strong monitoring mechanism associated with dispersed private ownership (Xu, Zhu and Lin 2005). Foreign ownership has positive and significant effects on all outcomes except for the investment rate. This can reflect a number of mechanisms such as better access to finance and/or technological and managerial know-how. *Finally*, a large ownership share of the largest owner is negatively related to labor productivity, sales growth, and export share.

Geography and Infrastructure. Both measures of geography are largely uncorrelated with firm growth. A larger country (in terms of population) is associated with higher TFP, investment rate, and lower export intensity. These effects are consistent with the interpretation that a large domestic market as proxied by population leads to higher production scale, a finer division of labor (and thus productivity levels), and less need to rely on exports. Infrastructure, while not significantly related to either productivity or growth, is highly significant in explaining exports and investment rates. The telecom index is positively and significantly associated with export and investment rates; and positively but insignificantly with labor productivity and sales growth.

Modern telecom infrastructure thus emerges as an important force behind enabling better firm performance. Similarly, lower transportation costs to export are associated with more exports and a higher investment rate.

Political and institutional factors. The number of years that the ruling party has been in power is negatively associated with TFP, labor productivity and sales growth. These negative effects likely reflect the fear of entrepreneurs in expanding and investing when expropriation risks increase. The negative correlation of party monopoly with productivity is consistent with the notion that fears of government expropriation may shift firms to engage in low-productivity businesses. This finding is the opposite of the “stationary bandits” hypothesis which suggests that a long time horizon for rulers leads to better economic outcomes due to the design of better economic policies. Similarly, countries that experienced domestic conflicts in the previous ten years tend to have lower TFP and labor productivity (significantly) and sales growth (insignificantly). This is not surprising since the possibility of domestic conflicts shorten entrepreneurs’ horizon for reaping returns from investments, causing them to limit their investment choices (and thus lower productivity) and expand more slowly.²¹ Interestingly, more conflicts in the past are also associated with more exports. This could reflect omitted variable bias: natural resources (such as diamonds) cause both more (natural resources) exports and more domestic conflicts (Sachs and Warner 2001). As we shall see, this conjecture is confirmed later. While ethnic fractionalization has been suggested as an important cause of macro outcomes (Easterly and Levine 1997; Collier and Gunning 1999a), we do not find it to be significantly associated with our micro outcomes. We cannot, of course, rule out the possibility that ethnic

²¹ Alternatively, whatever institutional factors that lead to more domestic conflicts also lead to worse firm performance.

fractionalization affects these outcome *through* the policy/environmental variables we control for here.

Business environment. The local share of bribe payments in sales is negatively related to sales growth rates. Though statistically insignificant, this result is consistent with other studies in developing countries. The effect of crime is also negative for all five outcomes; the negative impact is significant for sales growth and export share. One of the key components of managerial discretion, firing costs, is associated with higher TFP and labor productivity, which likely reflects the fact that managers hire fewer workers and substitute them with capital when firing costs are higher. Firing costs are also associated with lower sales growth rates, which may reflect firms' lower willingness to expand when it is difficult to reduce the number of workers if necessary.

Foreign presence in an industry, as proxied by the share of foreign ownership within a country-industry cell, reduces investment rates and labor productivity. This may reflect the market stealing effects of foreign entry (Aitken and Harrison 1999). We do, however, find positive spillover effects of foreign ownership on export shares, which is also consistent with Aitken, Hanson, and Harrison (1997). Foreign presence in an industry is, therefore, positively associated with boosting export orientation, perhaps reflecting information sharing on export destinations and products. Finally, our measure of domestic competition is significantly and positively associated with investment.

Financial access. Access to bank finance (i.e., overdraft facilities) is positively correlated with TFP (insignificant) and labor productivity, yet it is also *negatively* correlated with export intensity. The positive correlation of formal finance and productivity is consistent with the macro finance-growth literature (Levine 1997). The negative correlation with export intensity,

somewhat puzzling, suggests that formal financing may encourage firms to focus more on the domestic market. Interestingly, the prevalence of *trade credit* has a stronger positive correlation with labor productivity and export intensity. Thus, informal finance may have played a stronger role in facilitating local development in developing countries.

Alternative TFP Measures

As discussed earlier, our TFP measure is derived from estimating an income-industry-specific production function and measured as the residual from such a production function.²² This is to allow for the possibility that technology could differ by income levels so that the factor shares may differ. Alternatively, we could allow for technology heterogeneity in other ways. In one sensitivity check, we classify countries into regions, and we allow for region-industry-specific technology (i.e., factor shares).²³ We obtain TFP as the residual in such a production function. In another sensitivity check, we ignore technology heterogeneity across countries, and only allow for an industry-specific production function.²⁴

The results exploring alternative specifications for TFP are reported in Table 5. Most of the results are quite robust. Our key variable, the African premium for TFP, remains positive and significant at the 10 percent level in all columns, with magnitudes all larger than 126 log point. Especially robust are log(party years), any conflicts in the previous ten years, firing

²² In this paper, we only consider the Cobb-Douglas production function.

²³ And industry-specific intercept.

²⁴ In two other sensitivity checks, we rely on the TFP based on the assumption of region-industry-specific technology, but winsorize the TFP at the tail one and two percent respectively to reduce the influence of outliers. This could be important since measurement errors could be large in a large cross-country firm surveys in which the surveys could be implemented differently, and the measurement of factors and value added could feature systematic errors. We obtained similar results.

difficulty, and $\log(\text{population})$. Previously insignificant, access to bank loans and trade credit are more likely to be significant when using other measures of TFP.

Do the large Africa premiums reflect multicollinearity?

The large and positive *conditional* African premiums for TFP, labor productivity and sales growth may surprise many. Does the positive and significant coefficient for the Africa dummy merely reflect the close correlation of this dummy variable with some of the aggregate (national or local) variables? Alternatively, could the positive Africa premium merely reflect the fact that some variables are endogenous and their inclusion in the regressions bias the estimates of the Africa dummy? For instance, one could argue that good firm performance may encourage the local region to develop their telecom network, and this reverse causality may cause bias in all other coefficients. One solution is to leave out potential endogenous variables one at a time, and see if our estimate of the Africa effect is robust to these omissions. In Table 6, we run a series of regressions for each of the dependent variable, dropping one aggregate variable at one time, and ascertain that the Africa dummy remains significant and with similar magnitudes in the TFP, labor productivity and sales growth equations.

Omitting other business environment variables?

As with any study using cross-sectional data, a legitimate concern is that the effects of our business environment variables may merely reflect those of omitted variables. To consider this possibility, we examine the robustness of our key results when we include more controls for the business and macro environments. In particular, we add the following controls. First, we

capture openness with a measure of imports and export as a share of GDP. Sachs and Warner (1997) find cross-country evidence that African disadvantage can be partly explained by the lack of openness.

Second, we add more political and institutional factors, including voice and accountability from ICRG, executive competition from DPI, and government size to capture the de facto power of the government.²⁵ We control for government size because we are concerned that the strong negative effects associated with political monopoly may merely capture the association of political monopoly with (the omitted) government macro policies. Since the negative effect of political monopoly may reflect other omitted governance variables, we also further control for “voice and accountability” and executive competition.

Third, some argue that Africa is particularly affected by a “natural resource curse”. Some economists have argued that SSA countries are more likely to be located in tropical areas, which have poorer quality of soil and a worse disease environment and are therefore bad for development (Sachs and Warner 1997). Other economists have argued that countries with a heavy reliance on natural resource exports tend to have worse economic performance due to a number of reasons such as the lack of diversification. To capture the natural resource curse, we include three measures: the share of land area in tropics, the ratio of petroleum export over GDP (lagged by one year), and the ratio of raw material export over GDP, lagged by one year.²⁶

Fourth, since the business environment is a large category that covers many aspects, we try to control for further subjective measures of business environment constraints, including the local share of firms viewing the following business environment elements as moderate or severe

²⁵ Moreover, we have also tried adding inflation rate or a dummy variable of high inflation rate to proxy for macro risks, and have not found it matter.

²⁶ The first measure is from <http://www.cid.ha>, while the latter two are both from WDI of the World Bank.

constraint: electricity, transport, informal competition, tax rate, land access, financial access, and labor regulation. Since entry barriers are particularly important (Klapper, Laeven and Rajan 2006), we also control for an objective measure of entry barrier, namely, the logarithm of minimum capital to start a business (from Doing Business).

Overall, our results are generally robust (see Table 7). The African advantage in TFP and labor productivity becomes more pronounced: TFP premium is 175 log points versus 126 before, the labor productivity premium is 278 log points now vs. 212 log points before. The African advantage in sales growth loses statistical significance but with very similar magnitudes. The African conditional disadvantage in export intensity becomes more pronounced, at 5.9 percent and significant.

Some changes in the coefficients of the original control variables are interesting. The puzzling negative effect of infrastructure on investment intensity disappears and becomes statistically insignificant, while its effect on both productivity measures becomes positive and significant. The positive effects of telecom on sales growth become significant. The negative effects of bribes become significant for export intensity. Interestingly, firing difficulty now has no significant effects on labor productivity and growth, suggesting that the earlier effects of firing difficulty may reflect spurious correlation due to omitted variables. Most importantly, one key result of ours, the negative effects of political monopoly, becomes even stronger after controlling for macro policies and other aspects of governance: the negative effects on TFP and sales growth remain significant, while its negative effect on labor productivity becomes more pronounced and statistically significant.

Most of the locally-perceived constraint variables are not statistically significant, and often they are the wrong sign. This is consistent with the perception that objective measures tend

to out-perform subjective measures of the business environment (Dethier et al. 2008). The entry-barrier measure, the minimum capital to start a business, has a negative association with TFP and labor productivity but a positive association with export intensity and investment rate, perhaps because such entry barriers tend to foster large firms that have higher export capacity and investment.²⁷ We do not find that the two proxies of natural resources matter in an important or robust way. Neither does openness matter much.

Adding four rich African countries

So far our “Africa” consists of SSA countries excluding the four richest sub-Saharan countries (i.e., South Africa, Namibia, Mauritius, and Botswana), all of which have GDP per capita exceeding 3000 U.S. dollars (in 2005 value). Some may want to know how all of SSA is doing. To shed light on this, in this section we define Africa to include the four rich SSA countries. The results suggest that there is still a sizable African advantage in TFP (86 log point), labor productivity levels (142 log point), and sales growth (16 percent). The coefficients of the other variables are very similar.²⁸ Thus adding the four rich countries, while supposedly would add to the Africa’s conditional advantage, reduces but does not eliminate Africa’s conditional advantage.

²⁷ Hallward-Dreimeier et al. (2010) suggest that the within-location variations in regulation discretion (as proxied by things such as the standard deviation of managerial time spent on dealing with regulators) reduce firm performance. We have tried this, and when we have few control variables, this variable behaves as their paper conjectures. However, once we have our comprehensive list of variables, this variable no longer matter. This is not surprising since this variable captures similar things as government expropriation.

²⁸ The results are available upon request.

IV. Further Considerations

In this section, we provide further sensitivity checks, and then investigate how the effects of the business environment differ in several key dimensions. We want to understand whether African firms have a distinct conditional performance advantage depending on their industries and technologies.

Manufacturing versus services

So far we have focused on how African manufacturing firms fare relative to those in other regions and the determinants of manufacturing firms' performance. However, do the results differ if we look at services? Different sectors may rely to a greater degree on the political and business environment. To understand the differences between manufacturing and services and to gain insights about the heterogeneous effects of the business environment, we thus estimate our base specifications for services now (to be contrasted with the estimates in Table 4 for manufacturing firms). Since WBES has no good capital data for services, we cannot estimate TFP for services. We thus focus on comparing the other four measures. The results, in Table 8, indicate significant sectoral differences, and suggest that most of the business environment variables have stronger effects in manufacturing than in services.

The conditional Africa advantage is much larger in manufacturing than in services. For instance, the conditional African advantage for log labor productivity is 212 for manufacturing but only 91 log points and insignificant for services. The conditional advantage for sales growth is 23 for manufacturing and only 15 percent as well as insignificant for services.

Party monopoly significantly reduces growth in manufacturing but not in services. Thus party monopoly is associated with shifting a country's sector structure gradually from

manufacturing to services over time, perhaps because assets in services are less specific or more difficult to expropriate. Similarly, crime tends to have much stronger effects on manufacturing, but has virtually no effect on service firms. Since in developing countries manufacturing tends to out-perform services in productivity (McMillan and Rodrik 2011), party monopoly and crime thus shift a country's sector structure to less productive sectors, and lower a country's overall allocation efficiency. Interestingly, foreign ownership has no positive spillovers on exports in services but has such spillovers in manufacturing.

In contrast, bribes seem to have more adverse effects for services, as seen in the negative and significant coefficients for sales growth and the investment rate for services only. In addition, sales growth rates of service firms are more affected by the availability of formal finance than manufacturing firms.

Low-tech and high-tech manufacturing

Does the conditional African advantage differ by the level of sophistication of particular manufacturing industries? How do the effects of the business environment differ for industries with distinct technology sophistication? These questions are interesting since countries at different stages of development often display distinct areas of comparative advantage (Lin 2009, 2010; and Lin and Monga 2010), and industries with varying level of technological sophistication and specific investments may need different supporting institutions and business environments (Lin 2010).

Since Africa is largely located at the less sophisticated end of the technology spectrum, Africa's comparative advantage likely is in low-tech rather than high-tech manufacturing. We thus expect the conditional African advantage to be larger for the low-tech than for the high-tech manufacturing sector. We classify the manufacturing sectors as low-tech manufacturing if

enterprises are in food and beverages, leather, wood processing and wood products, simple metal products, textiles, or garments. We classify as high-tech manufacturing firms in metal and machinery, electronics, chemical and pharmaceutical products, non-metal and plastic, automobile and parts.²⁹

Table 9 shows that the conditional Africa advantage is indeed higher in low-tech manufacturing. For labor productivity the Africa advantage is 268 log points for low-tech manufacturing, but 151 for high-tech manufacturing. The conditional Africa advantage for sales growth is 26 percent for low-tech manufacturing, but is only 12 percent (insignificant) for high-tech manufacturing. However, the conditional Africa advantage in TFP levels is slightly higher for high-tech industries (1.67 vs. 1.22).

The dependence on modern infrastructure should be higher for high-tech manufacturing, and this is indeed the case. The telecom index is statistically significant for high-tech manufacturing for all outcomes except TFP. In contrast, telecom significantly affects none of the five outcomes for low-tech manufacturing. Interestingly, export transportation costs significantly reduced export shares only for low-tech industries, where Africa is more likely to generate export sales.

Party monopoly has more adverse effects on low-tech industries, and reduces sales growth only for low-tech industries. Similarly, corruption is associated with a more adverse effect on low-tech than on high-tech manufacturing. It has negative and significant effects on investment rates only for low-tech manufacturing. Crime has much more severe negative effects on high-tech than on low-tech manufacturing.

²⁹ The data set has “other manufacturing”, which is not classified as either since we don’t know its nature.

While domestic competition (e.g., the competition index) does not matter much for low-tech industries, strong competition in high-tech manufacturing is associated with a higher investment rate, more exports, and lower TFP. Firing costs are associated with more adverse effects for high-tech than for low-tech manufacturing industries as well. Finally, tariff promotion is only associated with positive effects in high tech industries—suggesting that trade incentives only work in promoting new, not existing areas of comparative advantage.

Selection bias associated with the size of the informal sector

So far we have found a conditional large and positive Africa premium in productivity and sales growth rate. A concern is that the Africa premiums merely reflect selection bias. In particular, only formal firms are present in our data. Since it is possible that African countries have a relatively higher share of informal firms, and more able firms tend to self-select into the formal sector, then the African premiums may reflect a smaller group of high-ability firms self-selecting into the formal sector, and overall there is in fact no (conditional) African premium.

This is a valid concern. Shneider et al. (2010) offer estimates of the relative size of informal sector in the whole economy for around 160 countries, and is the best data on informal sector available.³⁰ By this informality index (which captures the share of the informal sector in the whole economy), Africa does have relatively high level of informality. Africa's average of 41.9 percent (ranging from 30.3 to 56.4 percent) is slightly above the average of 40.8 for the similar-income group (ranging from 15.1 to 66.1%), and the average of 36.7% for the non-Africa group (ranging from 15.1 to 66.1%). To make sure that the non-African sample has a similar

³⁰ Ayyagari et al. (2011) similarly relies on this informality index to address concern about selectivity based on informality.

level of informality, we now retain the African sample and the non-African sample with the informality index overlapping with the African informality range, that is, from 30.3% to 56.4%. The results are reported in Table 10.

TFP, which was statistically significant with a coefficient of 1.26, now has a coefficient that is roughly 1/3 smaller, at 0.83 (with a t-statistic of 1.55). However, selection bias apparently cannot explain the overall pattern of conditional African premiums in labor productivity: the labor productivity premium is only slightly smaller (from 2.12 to 1.79) and remains statistically significant, and the sales growth premium actually increases from 0.23 to 0.37. The most plausible story behind the lower estimate for the African productivity premium and higher growth premium is that those selected firms in high-informality countries tend to have higher capacity (and therefore higher productivity) and lower growth potential (due perhaps to worse business environments associated with a high informality).

There are several other notable findings. First, the negative effects of party monopoly are even stronger in countries with higher informality. Second, crime is less important in these countries. Third, access to finance, both formal and informal, is no longer positively associated with productivity. Access to formal finance, however, is more positively associated with firm growth rates.

The overall patterns in Table 10 suggest that some forces of selection could explain a part of the conditional African premiums, but that the selection story is far from the whole story. The conditional African premiums in sales growth and labor productivity remain intact and significant, and the conditional African premium in TFP remains positive and large though insignificant. High-informality countries also limit the influence of crime and finance, but amplify the influence of party monopoly.

Labor Productivity Growth

So far we have shown that conditional on basic firm characteristics, geography, institutional and business environments, Africa has a conditional advantage in productivity level and sales growth. However, labor productivity could reflect differences in input use. TFP levels (measured across countries) may not fully capture differences in productive efficiency since they may be affected by differences in markups and prices (Foster et al. 2008). Sales growth, capturing growth in both inputs and efficiency, does not allow us to distinguish the contribution of their respective contributions. To further understand how infrastructure, geography, political and business environments affect firms' efficiency improvement over time, we push our data further by using the growth rate of labor productivity as our performance measure. The advantage of using growth in labor productivity is that we can filter out the component of markup ratios and price differentials if they are relatively stable over a short time period. Moreover, growth in labor productivity perhaps better capture the gains from improvement in efficiency over time, including those originating from technological and organizational efficiency, and increasing competition. While an even better measure would be the growth rate of TFP, the data set only asks sales and employment in the survey year and three years earlier, so that multiple observations of TFP cannot be computed.

Table 11 reports the results for growth in labor productivity. In column (1), we present the base results for manufacturing firms. In column (2), we add more controls to address the possibility of omitted variable bias. In column (3), we report the base specification for service sectors. Before discussing the results, we note that labor productivity growth in Africa is fairly low, with a mean of -11.3%. This is lower than the average comparison group and the better

comparison group by around 8 percentage points. Thus Africa has a quite large unconditional disadvantage in productivity growth—perhaps the most glaring shortcoming for Africa.

Yet once we control for infrastructure, geography, institutional and the business environment, Africa has a strong conditional advantage in productivity growth, between 32 to 40 percent for manufacturing, and 19 percent for services. More strikingly, party monopoly is more strongly negatively correlated with productivity growth, especially in manufacturing, with a coefficient around -0.18, which is unaltered with the inclusion of the additional controls. The effect is significant but half as large in services, with a coefficient of -0.09. Similarly, domestic conflicts also have a robust and negative relationship with productivity growth. Among the business environment variables, crime has a negative correlation with productivity growth in manufacturing, with the effect again stronger in manufacturing than in services. Among firm characteristics, foreign ownership is robustly and positively correlated with productivity growth. Thus our key variables—party monopoly, domestic conflicts, and foreign ownership—have quite robust relationships (both negative and positive) with productivity growth.

V. **Explaining Africa’s Disadvantage**

We now examine why Africa falls behind the better comparison group—by reporting $100 \cdot \beta_X (X_{\text{Africa}} - X_{\text{better}}) / \Delta y$, the percentage of outcome differences due to the independent variables. Here X stand for an explanatory variable, y the outcome variable, and “better” stands for the better comparison group. β_X refers to the coefficient for a generic variable X . The coefficients are drawn from our baseline specification in Table 4 for our baseline performance measures, and from the base specification in Table 11 for labor productivity growth. X_{Africa} and X_{better} refer to the mean for Africa and for the better comparison group, and Δy refers to the

outcome difference between Africa and the better comparison group. For simplicity, only the statistically significant and quantitatively important effects are reported.³¹ The results are summarized in Table 12.

The key factors explaining Africa's disadvantage are political and institutional factors (mainly party monopoly), access to finance, infrastructure, and geography. In contrast, (the narrowly-defined) business environment and firm characteristics (except for foreign ownership) explain relatively little of Africa's disadvantage. Party monopoly is the key factor in explaining the relative performance of African firms. It accounts for -81% of the TFP *advantage*. It also explains 711% of the sales growth shortage of Africa (of only 0.8 percentage points) and 97% of the large disadvantage in labor productivity growth for Africa.

Second, access to finance contributes importantly to Africa's disadvantage, especially informal finance. It is the number one explanatory category for labor productivity (252% of the labor productivity disadvantage), and the number two explanatory category for export share (28% of the export share shortage). Collier and Gunning (1999b) suggest that a lack of financial depth may be a reason behind Africa's growth shortfall; our accounting results suggest that if finance matters, informal finance likely matters even more for Africa.

Geography, mainly population size, is the number one factor dragging down Africa's relative TFP. It is also a key factor behind the African disadvantage in investment rates.

Business environment matters marginally. Though the second most important factor hindering sales growth—keep in mind that Africa lag only slightly behind in this dimension--it also explains a marginal 29% of the TFP *advantage*.

³¹ Being quantitatively important means accounting for more than 4% of the outcome difference in absolute value.

Similarly, **infrastructure** does not explain much of productivity or sales growth for Africa, but explains 48% of African manufacturing's disadvantage in export shares, and 37% of the African disadvantage in investment rates. For both export shares and investment rates, infrastructure is the number one explanatory category. Telecom emerges as particularly important in this infrastructure category.

Among **firm characteristics**, foreign ownership consistently contributes positively to both productivity and firm growth,³² while the concentration of ownership is a negative force for both productivity and growth.

VI. Conclusions

In this paper we use a comprehensive cross-country firm-level data to understand how formal African firms stack up against those in other regions. We also explore whether Africa's political and business environment can explain its performance shortfalls (if any), and what the key factors are for explaining Africa's performance. We begin by comparing the unconditional means of various performance measures. We find that formal African manufacturing firms show a slight advantage in total factor productivity (TFP) levels, a slight disadvantage in labor productivity, and similar sales growth rate; they also have a large shortfall in productivity growth, export orientation and the investment rate.

Once we control for key differences in firm characteristics, geography, infrastructure, political and institutional factors, business environment, and finance, Africa manufacturing firms actually exhibit a *conditional advantage* in productivity levels and growth, as well as sales

³² Lederman et al. (2013) also provides evidence that foreign ownership has positive effects in Africa.

growth. This conditional advantage remains largely intact across a variety of robustness checks and additional specifications.

The conditional advantage for African firms is higher in low-tech than in high-tech manufacturing, and in manufacturing than in services. While geography, infrastructure, and access to finance prove to be important in explaining Africa's disadvantage in firm performance relative to better-performing similar income countries, the most important factor is party monopoly. Indeed, for manufacturing firms, party monopoly reduces their productivity levels and growth, as well as their sales growth, and these adverse effects are especially severe in countries with higher informality. Since manufacturing as a sector has relatively high productivity growth in developing countries (McMillan and Rodrik 2011), party monopoly thus hinders a key driver of development by lowering manufacturing productivity levels and sustainable growth rates. In contrast, the business environment and firm characteristics do not matter as much. Besides geography, the key explanations for African disadvantages are associated with the basic market-supporting roles of the government: property rights protection, infrastructure, and access to finance.

The findings in this paper have direct policy implications. The first implication is somewhat optimistic for Africa. The results indicate that conditional on the business environment, African firms actually have productivity and sales growth advantages—at least no disadvantage relative to other countries with similar GDP per capita. So there is no inherent Africa “curse” that hinders its development; only a need for action to address the poor political and business environment. This is consistent with Africa's growth record before the 1970s and the growth record in the past decade. Second, our results show that Africa's comparative advantage is in low-tech manufacturing (instead of high-tech manufacturing or services). Third,

since the key business environment variables that explain the African shortfall relative to the better-performing similar countries are mostly related to the functions of the state, state reforms are likely to have the largest impact on African competitiveness.

The paper suggests that there are several ways for African firms to shift gears and move towards a positive reinforcing cycle of development. For instance, foreign ownership has yielded positive benefits according to our results. This suggests that additional foreign entry would improve competitiveness and promote development. The key importance of market size (as proxied by log population) suggests that trade agreements and regional trade blocs to increase market size could be beneficial. To increase access to finance and especially trade finance, complementary institutions such as contract enforcement mechanisms for trade credit disputes could be considered. Given the key importance of reducing party monopoly for our results, political competition and accountability would be the critical factor for inducing better firm performance.

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Table 1. Definition of variables

Variable	Definitions
<i>TFP</i>	Total factor productivity.
<i>ln(LP)</i>	Log(value added per worker). From the Enterprise Survey of the World Bank.
<i>LP growth</i>	(Three-year) labor productivity growth rate at the firm level, computed as (labor productivity this year – labor productivity three years ago)/their average. All monetary values are in this paper in constant U.S. dollars in 2005.
<i>sale growth</i>	(Three-year) sales growth rate at the firm level, computed as (sales this year – sales three years ago)/their average.
<i>Export share</i>	Export value over sales.
<i>Inv/VA</i>	The value of investment over total value added for a firm. Investment is the sum of new purchases in equipment and land. Trimmed of tail one percent.
<i>lnL</i>	The logarithm of the number of employees.
<i>Firm age</i>	Firm age.
<i>Foreign</i>	The share of foreign ownership.
<i>Ind avg Foreign</i>	Country-industry (employment-weighted) average of foreign ownership.
<i>Ownership largest</i>	The ownership share of the largest owner of the firm.
<i>GDP per capita</i>	GDP per capita in constant U.S. dollars. From WDI.
<i>Ln(population)</i>	Log of the population of the country. From WDI.
<i>Trade</i>	The ratio of the sum of the values of imports and exports over GDP. From WDI.
<i>govConsumption/GDP</i>	The ratio of total government consumption over GDP. From WDI.
<i>Landlock</i>	The dummy variable indicating that a country is landlocked.
<i>share of land in tropics</i>	The share of land areas in Koeppen-Geiger tropics, from http://www.cid.ha .
<i>Voice and accountability</i>	The index of voice and accountability, measuring perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. From ICRG.
<i>Ln(partyYears)</i>	Logarithm of the number of years that the ruling party has been in power, from DPI (Beck et al. 2001; Keefer 2007).
<i>Any Conflict</i>	The dummy variable of any domestic armed conflicts in the previous 10 years, from Gleditsch et al. (2002) and UCDP/PRIO (2010).
<i>EthnicFrac</i>	Ethnic fractionalization, a larger value implies more ethnic diversity, from WDI.
<i>Firing difficulty</i>	An index measuring the cost of firing 20 percent of the firm's workers (10% are fired for redundancy and 10% without cause). The cost of firing a worker is calculated as the sum of the notice period, severance pay, and any mandatory penalties established by law or mandatory collective agreements for a worker with three years of tenure with the firm. Based on Doing Business (Botero et al. 2004).
<i>Executive competition</i>	An index measuring the competition for the executive branch of the government, from DPI (Beck et al. 2001; Keefer 2007).
<i>Min capital to start business</i>	A proxy for entry barriers, the minimum capital required (% of income per capita) for starting a business, from Doing Business of World Bank.
<i>Telecom</i>	The principal factor for two telecom-related variables: (i) log of the number of mainline phones per 10000 inhabitants in a country (from WDI); (ii) the city-industry-size share of firms using website for business (from the Enterprise Survey). <i>Size</i> is defined as large and small based on whether the firm is above or below the median of the cell. When the cell size falls below 5 firms, we use the city-industry mean instead. All proxies for business environment based on firm answers are dealt with in the same way as here.
<i>Infrastructure index</i>	An index of the quality of trade and transport related to infrastructure (e.g., ports, roads, railroads, information technology). From World Bank.

Table 1. Definition of variables (Cont'd)

Variable	Definitions
<i>Cost Export</i>	Transport cost to export (in US\$ per container), from Doing Business.
<i>Bribe</i>	The city-industry-size average of the share of bribes to governments over sales.
<i>Bank</i>	The city-industry-size share of firms having access to overdraft facility, as a proxy of access to formal finance.
<i>Trade Credit</i>	The city-industry-size average of the share of output sold in the form of supplier credit, as a proxy of local access to informal finance.
<i>Competition_ind</i>	The Lerner index of competition, constructed as $(1 - \text{markup}_{CI})$, and markup_{CI} is the country-industry average of firm-level markup. Firm-level markup is computed as $(\text{value added} - \text{labor costs})/\text{sales}$.
<i>Tariff</i>	Country-industry-year level of import tariffs.
<i>Obstacle_crime</i>	The city-industry-size share of firms that view crime as a moderate or severe constraint.
<i>Obstacle_InformalCompete</i>	The city-industry-size share of firms viewing “practices of competitors in the informal sector” as a serious obstacle.
<i>Obstacle_landAccess</i>	The city-industry-size share of local firms that view access to land as a moderate or severe constraint.
<i>Obstacle_electricity</i>	The city-industry-size share of firms that view electricity access as a moderate or severe constraint.
<i>Obstacle_transport</i>	The city-industry-size share of firms that view transport as a moderate or severe constraint.
<i>Obstacle_tax</i>	The city-industry-size share of firms that view tax burdens as a moderate or severe constraint.
<i>Obstacle_finance</i>	The city-industry-size share of firms that view finance access and costs as a moderate or severe constraint.
<i>Obstacle_laborRegulation</i>	The city-industry-size share of firms that view labor regulation as a moderate or severe constraint.
<i>Petroleum export/GDP_{t-1}</i>	The ratio of petroleum export over GDP, lagged by one year, from WDI.
<i>Raw material export/GDP_{t-1}</i>	The ratio of raw material export over GDP, lagged by one year, from WDI.

Table 2. Differences between Africa and the two comparison groups

Variable	t-test for <i>median</i> difference		
	Africa	Africa – the average comparison group	Africa – the better comparison group
TFP	0.176 (1.925)	0.483 (0.039)***	0.301 (0.049)***
ln(LP)	9.221 (0.036)	-0.054 (0.036)*	-0.292 (0.044)***
LP growth	-0.113 (0.011)	-0.083 (0.015)***	-0.084 (0.017)***
sale growth	0.066 (0.010)	-0.008 (0.014)	0.008 (0.016)
export share	0.074 (0.003)	-0.086 (0.005)***	-0.138 (0.007)***
Inv/VA	0.134 (0.005)	-0.041 (0.008)***	-0.099 (0.011)***
lnL	2.958 (0.019)	-0.698 (0.025)***	-1.021 (0.029)***
Firm age	13.116 (0.201)	-4.894 (0.300)***	-3.173 (0.332)***
State	0.007 (0.074)	-0.004 (0.001)***	-0.006 (0.002)***
Foreign	0.156 (0.005)	0.058 (0.005)***	0.034 (0.007)***
Ownership largest	0.822 (0.004)	0.082 (0.005)***	0.114 (0.006)***
GDP per capita	488.1 (7.680)	-1061 (13.8)***	-1022 (14.9)***
Ln(pop)	16.134 (0.016)	-0.601 (0.023)***	-1.327 (0.026)***
Landlock	0.249 (0.006)	0.005 (0.008)	0.139 (0.008)***
Ln(partyYears)	2.528 (0.013)	0.464 (0.023)***	0.149 (0.026)***
Any Conflict	0.504 (0.007)	0.095 (0.009)***	-0.026 (0.011)***
EthnicFrac	0.716 (0.002)	0.316 (0.003)***	0.369 (0.004)***
costExport	1376.82 (13.27)	116.83 (13.30)***	280.07 (15.60)***
Telecom	-1.235 (0.008)	-1.307 (0.010)***	-1.514 (0.012)***
Infrastructure	2.112 (0.006)	-0.295 (0.005)***	-0.336 (0.006)***
Bribe	0.029 (0.0004)	0.013 (0.0005)***	0.018 (0.0005)***
Obstacle_crime	0.385 (0.003)	-0.001 (0.004)	0.091 (0.005)***
FireCosts	0.405 (0.003)	0.098 (0.003)***	0.029 (0.004)***
Competition_ind	0.600 (0.003)	-0.015 (0.002)***	-0.021 (0.003)***
Tariff	0.146 (0.001)	0.054 (0.001)***	0.055 (0.002)***
Trade credit	0.274 (0.002)	-0.265 (0.003)***	-0.297 (0.004)***
Bank	0.234 (0.003)	-0.218 (0.005)***	-0.120 (0.005)***

One-sided test. *, ** and *** means significance at the 10, 5 and 1 percent levels.

Table 3. Industry distribution for Africa, the average comparison group, and the better comparison group

	Poor Africa (without the four rich countries)	The average comparison group	The better comparison group
Textiles	0.018	0.066	0.051
Garments	0.136	0.164	0.180
Metal & Machinery	0.065	0.105	0.165
Electronics	0.006	0.026	0.044
Chemical, pharmaceutical	0.040	0.103	0.085
Wood and furniture	0.019	0.023	0.030
Non-metal and plastic	0.041	0.103	0.131
Automobiles and parts	0.000	0.002	0.003
Other manufacturing	0.436	0.174	0.108

Note. Manufacturing sample only.

Table 4. Explaining Firm Performance, OLS results

	TFP		Ln(LP)		Sales Growth		Export Share		Inv/VA	
Poor Africa	1.264**	0.535	2.119**	1.021	0.226**	0.111	-0.026	0.034	-0.040	0.030
Firm characteristics										
Ln(firm age)	0.005	0.026	0.121***	0.030	-0.028**	0.013	0.003	0.004	-0.026***	0.004
State	0.577*	0.323	0.818***	0.256	0.261**	0.104	0.163***	0.062	0.093	0.084
Foreign	0.394***	0.091	0.751***	0.101	0.145***	0.038	0.218***	0.030	-0.000	0.011
Ownership largest	-0.108	0.099	-0.220*	0.125	-0.105***	0.030	-0.042**	0.018	0.008	0.013
Ln(sales 3 years ago)					-0.074***	0.011				
Geography										
Ln(population)	0.253**	0.115	0.231	0.173	0.021	0.030	-0.020***	0.007	0.015*	0.008
Landlock	0.229	0.223	0.212	0.299	-0.055	0.096	0.028	0.018	0.059***	0.023
Infrastructure										
Infrastructure index	0.025	0.298	0.894	0.547	0.035	0.102	-0.080***	0.023	-0.135***	0.028
Ln(CostExport)	-0.047	0.188	0.297	0.260	-0.054	0.061	-0.096***	0.021	-0.078***	0.025
Telecom	0.004	0.210	0.350	0.325	0.073	0.063	0.046***	0.014	0.042**	0.018
Political and institutional factors										
Ln(party years)	-0.524**	0.231	-0.580	0.370	-0.113**	0.054	-0.012	0.009	-0.002	0.011
Any conflict in past 10 years	-0.877**	0.368	-1.065*	0.617	-0.106	0.084	0.040**	0.017	-0.027	0.022
Ethnic fractionalization	-0.632	0.777	-0.821	1.302	0.085	0.207	-0.005	0.039	0.051	0.044
Business environment										
Bribe	2.249	1.747	-1.005	2.295	-0.786	0.607	-0.220	0.224	-0.134	0.216
Obstacle_crime	-0.597	0.396	-0.608	0.604	-0.174*	0.090	-0.045*	0.025	-0.034	0.041
Firing difficulty	1.138**	0.460	1.494**	0.665	-0.240**	0.112	0.012	0.026	0.015	0.029
Competition_ind	-0.786	0.915	-0.300	0.764	-0.022	0.119	0.062	0.042	0.197***	0.054
Tariff	1.185*	0.635	1.229	1.024	0.243	0.215	0.056	0.162	0.014	0.087
Country-industry avg of foreign	-0.405	0.357	-1.379*	0.718	0.038	0.095	0.193***	0.048	-0.069*	0.039
Finance										
Bank	0.430	0.267	0.613**	0.300	0.117	0.099	-0.067**	0.028	-0.019	0.032
Trade credit	0.284	0.320	0.881**	0.438	0.093	0.096	0.157***	0.037	0.070	0.047
N	9,569		12,196		10,362		13,296		9,602	
r2_a	0.117		0.296		0.118		0.175		0.036	

Note. *, **, and *** represent statistical significance at the 10, 5 and 1 percent levels. White standard errors, clustered at the country level. Coefficients for industry dummies not reported.

Table 5. Sensitivity checks with respect to Total Factor Productivity (TFP) measure

	Income-category-ind tech	Region-ind tech	Ind tech
Poor Africa	1.264** (0.535)	1.303* (0.764)	2.080** (0.985)
Firm characteristics			
State	0.577* (0.323)	0.491 (0.333)	0.516* (0.285)
Foreign	0.394*** (0.091)	0.435*** (0.096)	0.391*** (0.114)
Geography			
Ln(population)	0.253** (0.115)	0.293** (0.146)	0.233 (0.167)
Poli & Inst. Factors			
Ln(party years)	-0.524** (0.231)	-0.641** (0.312)	-0.797** (0.399)
Any conflicts in 10 yrs	-0.877** (0.368)	-1.076** (0.500)	-1.222* (0.636)
Business environment			
Obstacle_crime	-0.597 (0.396)	-0.872** (0.428)	-0.625 (0.517)
Firing difficulty	1.138** (0.460)	1.735*** (0.564)	1.768** (0.688)
Finance			
Bank	0.430 (0.267)	0.637* (0.342)	0.938** (0.416)
Trade credit	0.284 (0.320)	0.833** (0.326)	0.228 (0.388)
Other controls: Ln(firm age), ownership largest, landlock, infrastructure index, ln(cost export), telecom, ethnic frac., bribe, competition_ind, tariff, country-ind avg of foreign,			
Adjusted R squared	0.184	0.221	0.117

To save space, results on variables that are never significant at 5 percent level in any of the columns are not shown. The number of observation is 9569 for all columns.

Table 6. The coefficient for Africa when dropping one explanatory variable at a time

	<u>TFP</u>		<u>ln(LP)</u>		<u>Sales Growth</u>		<u>Export Share</u>		<u>inv/VA</u>	
	coef	se	coef	se	coef	se	coef	se	coef	se
Base (no dropping)	1.264**	0.535	2.119**	1.021	0.226**	0.111	-0.026	0.034	-0.040	0.030
When dropping:										
ln(firm age)	1.263**	0.536	2.120**	1.024	0.226**	0.111	-0.024	0.034	-0.038	0.032
Foreign	1.281**	0.534	2.152**	1.022	0.222**	0.108	-0.015	0.036	-0.040	0.030
State	1.258**	0.537	2.108**	1.020	0.222**	0.110	-0.027	0.034	-0.041	0.030
ln(party years)	1.004*	0.534	1.672**	0.830	0.143	0.103	-0.035	0.033	-0.041	0.030
ln(population)	1.300**	0.604	2.099**	1.057	0.222*	0.115	-0.028	0.033	-0.040	0.032
Telecom	1.266**	0.573	2.051*	1.058	0.208*	0.112	-0.037	0.035	-0.051	0.032
ln(cost export)	1.275**	0.533	2.064**	1.018	0.237**	0.109	-0.008	0.043	-0.027	0.039
infrastructure index	1.164***	0.445	1.702**	0.777	0.233***	0.088	-0.009	0.035	0.003	0.037
any conflicts in 10 years	1.269*	0.716	1.988*	1.118	0.213*	0.116	-0.023	0.036	-0.040	0.030
ethnic fractionalization	1.128***	0.421	1.914**	0.747	0.247***	0.094	-0.027	0.032	-0.028	0.030
Bribe	1.280**	0.534	2.114**	1.023	0.221**	0.112	-0.027	0.034	-0.040	0.030
Crime	1.333**	0.577	2.180**	1.065	0.245**	0.114	-0.019	0.034	-0.035	0.030
firing difficulty	1.262**	0.578	1.998**	1.011	0.235**	0.103	-0.025	0.034	-0.038	0.030
country-ind avg foreign	1.253**	0.537	2.092**	1.042	0.228**	0.110	-0.023	0.038	-0.041	0.029
Bank	1.282**	0.543	2.116**	1.027	0.231**	0.113	-0.027	0.036	-0.042	0.031
trade credit	1.242**	0.534	2.055**	1.018	0.219**	0.111	-0.037	0.036	-0.044	0.031

Note. Each row reports the coefficient or standard error of the (poor) Africa dummy for all the outcome equations. For the “base” row, no variables are dropped. For row “x”, only “x” is dropped from the list of explanatory variables.

*, **, and *** represent statistical significance at the 10, 5 and 1 percent levels. White standard errors are clustered at the country level.

Table 7. Sensitivity checks with more controls

	TFP		Ln(LP)		Sales Growth		Export Share		Investment/Value Added	
Poor Africa	1.748***	0.552	2.782**	1.220	0.213	0.140	-0.059**	0.030	-0.042	0.028
Geography										
Ln(population)	0.130*	0.075	0.069	0.120	-0.006	0.031	-0.025***	0.009	-0.002	0.011
Landlock	0.183	0.254	0.227	0.370	-0.122*	0.065	0.028	0.018	0.030*	0.018
Infrastructure										
Infrastructure inex	1.216***	0.444	2.086**	0.938	-0.005	0.139	-0.029	0.028	-0.039	0.038
Ln(Cost Export)	0.413	0.259	0.597	0.441	-0.061	0.081	-0.102***	0.018	-0.085***	0.024
Telecom	-0.013	0.168	0.297	0.229	0.098**	0.047	0.018	0.017	0.010	0.018
Political and institutional factors										
Ln(party years)	-0.680***	0.229	-0.861*	0.455	-0.094**	0.044	-0.010	0.009	-0.005	0.009
Any conflicts in 10 years	-1.002**	0.399	-1.090	0.743	-0.081	0.088	0.031	0.019	-0.033*	0.020
Ethnic fractionalization	-1.671*	1.012	-2.576	1.948	0.104	0.242	0.028	0.054	0.032	0.067
Business environment										
Bribe	-0.651	2.004	-2.332	2.551	-0.496	0.534	-0.288*	0.160	-0.245	0.176
Obstacle_crime	-1.055***	0.346	-1.523***	0.564	-0.311***	0.080	-0.023	0.034	-0.016	0.033
Firing difficulty	1.047	0.646	1.528	1.044	-0.149	0.147	-0.025	0.029	-0.012	0.035
Competiton_ind	-0.997	0.791	-0.494	0.618	-0.102	0.099	0.105***	0.041	0.151***	0.049
Country-ind avg of foreign	-0.268	0.283	-1.268**	0.588	0.030	0.068	0.199***	0.041	-0.024	0.042
Tariff	0.060	0.387	0.041	0.611	0.105	0.149	0.016	0.134	-0.051	0.072
Finance										
Bank	0.571**	0.254	0.622	0.420	0.029	0.094	-0.064**	0.025	-0.027	0.035
Trade credit	-0.075	0.304	0.019	0.426	0.038	0.088	0.190***	0.045	0.093**	0.040
Openness										
Trade	0.006	0.004	0.003	0.006	-0.002*	0.001	0.000	0.000	0.000	0.000
More political & institutional factors										
Voice and accountability	-0.356	0.262	0.209	0.348	0.060	0.079	-0.097***	0.015	-0.105***	0.022
Executive competition	-0.182*	0.100	-0.380**	0.160	-0.047	0.034	0.024**	0.011	-0.015	0.018
Government size	-0.002	0.022	0.027	0.032	0.005	0.005	0.001	0.002	0.007**	0.003

Table 7. Sensitivity check with more controls (Cont'd)

	TFP		lnLP		Sales Growth		Export Share		inv_VA	
Further business environment										
Avg obstacle_electricity	-0.369*	0.212	-0.191	0.306	-0.014	0.061	0.020	0.027	0.021	0.030
Avg obstacle_transportation	0.196	0.243	-0.055	0.300	-0.083	0.072	0.017	0.031	-0.049	0.042
Avg obstacle_informal competition	-0.019	0.302	-0.128	0.529	-0.049	0.071	-0.108***	0.033	-0.018	0.036
Avg obstacle_tax rate	0.016	0.318	0.298	0.530	0.018	0.088	-0.009	0.035	0.046	0.029
Avg obstacle_land administration	0.735*	0.384	0.697*	0.423	0.117	0.079	-0.037	0.037	0.098**	0.042
Avg obstacle_financial access	0.562**	0.273	0.864	0.695	0.060	0.091	-0.027	0.032	-0.085**	0.034
Avg obstacle_labor regulation	0.037	0.350	0.222	0.447	0.079	0.105	0.132***	0.041	0.059	0.038
Ln(min capital to start business)	-0.094*	0.053	-0.162**	0.065	-0.002	0.012	0.015***	0.004	0.008**	0.004
Natural resource curse										
Petroleum export/GDP in t-1	-5.583**	2.225	-0.886	2.934	1.160	0.773	0.054	0.192	-0.249	0.439
Raw material export/GDP in t-1	0.452	1.196	0.808	2.298	0.300	0.739	-0.183**	0.071	0.363	0.249
Share of land in tropics	0.519	0.456	0.890	0.799	0.075	0.114	-0.045*	0.024	-0.038	0.031
Firm controls	Yes		Yes		Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes		Yes		Yes	
N	8,549		10,803		9,269		11,776		8,541	
r2_a	0.251		0.368		0.115		0.194		0.055	

*, **, and *** represent statistical significance at the 10, 5 and 1 percent levels. Intercept not reported.

White standard errors (unreported due to space constraint) are clustered at the country level.

We also control for all firm characteristics variable for all equations. For simplicity, we do not report them here.

Table 8. Services only

	Ln(LP)		Sales Growth		Export Share		inv_VA	
Poor Africa	0.914	0.603	0.153	0.094	0.004	0.012	-0.046**	0.019
Firm characteristics								
Ln(firm age)	0.082**	0.037	-0.034**	0.017	0.008***	0.002	-0.017***	0.006
State	-0.263	0.294	0.160	0.164	0.056	0.037	-0.016	0.035
Foreign	0.760***	0.105	0.140***	0.040	0.061***	0.011	0.006	0.014
Ownership largest	-0.038	0.130	0.018	0.040	-0.003	0.007	0.019*	0.011
Ln(sales 3 years ago)			-0.077***	0.015				
Geography								
Ln(population)	0.140	0.133	-0.004	0.023	-0.010***	0.004	0.007	0.005
Landlock	0.165	0.234	-0.031	0.074	-0.008	0.009	0.015	0.014
Infrastructure								
Infrastructure index	0.443	0.444	0.119	0.078	0.003	0.010	-0.053***	0.019
Ln(CostExport)	0.129	0.256	-0.013	0.055	-0.010	0.009	0.003	0.011
Telecom	0.453*	0.252	0.066	0.054	0.008	0.008	-0.028**	0.011
Political and institutional factors								
Ln(party years)	-0.264	0.226	-0.047	0.041	-0.001	0.004	-0.008	0.006
Any conflict in past 10 years	-0.779	0.547	-0.051	0.067	0.011	0.009	-0.036***	0.009
Ethnic fractionalization	0.230	0.595	-0.044	0.146	0.015	0.019	0.007	0.025
Business environment								
Bribe	-3.643	2.271	-1.462*	0.821	0.147	0.138	-0.408**	0.185
Obstacle_crime	-0.526	0.629	-0.153	0.094	-0.003	0.018	-0.036	0.027
Firing difficulty	1.270**	0.529	-0.049	0.120	-0.003	0.018	0.015	0.025
Competition_ind	-0.769	0.633	0.072	0.129	0.020	0.018	0.094*	0.048
Country-industry avg of foreign	-0.703	0.688	-0.071	0.134	-0.009	0.022	0.021	0.031
Tariff	-0.896	2.497	-0.608	0.620	-0.023	0.141	-0.574*	0.313
Finance								
Bank	0.642**	0.294	0.217**	0.095	0.004	0.022	0.003	0.030
Trade credit	0.799*	0.474	-0.023	0.115	0.068***	0.024	0.019	0.033
N	8,018		6,712		8,983		5,391	
r2_a	0.232		0.090		0.044		0.023	

Note. *, **, and ***: statistical significance at the 10, 5 and 1 percent levels. White standard errors are clustered at the country level. Industry dummies also controlled for.

Table 9. Determinants of firm performance by industry sophistication

	Low-tech manufacturing					High-tech manufacturing				
	TFP	Ln(LP)	Sales Growth	Export Share	Inv/VA	TFP	Ln(LP)	Sales Growth	Export Share	Inv/VA
Poor Africa	1.217** (0.491)	2.682** (1.084)	0.261** (0.127)	-0.077* (0.045)	-0.031 (0.041)	1.568*** (0.582)	1.513** (0.685)	0.122 (0.119)	0.043 (0.047)	0.017 (0.037)
Firm characteristics										
Ln(firm age)	0.039 (0.030)	0.147*** (0.031)	-0.028* (0.015)	-0.003 (0.008)	-0.021*** (0.007)	0.034 (0.036)	0.156*** (0.044)	-0.011 (0.018)	0.003 (0.008)	-0.028*** (0.008)
State	-0.129 (0.589)	0.546 (0.497)	0.307* (0.171)	0.313*** (0.086)	-0.081 (0.059)	0.963*** (0.340)	0.948*** (0.308)	0.374** (0.176)	0.057 (0.145)	0.102 (0.107)
Foreign	0.328*** (0.109)	0.606*** (0.121)	0.196*** (0.042)	0.253*** (0.032)	0.007 (0.021)	0.424*** (0.132)	0.721*** (0.122)	0.130** (0.057)	0.229*** (0.052)	0.007 (0.021)
Ownership largest	-0.141 (0.109)	-0.318** (0.141)	-0.085** (0.039)	-0.065*** (0.019)	0.019 (0.016)	0.033 (0.159)	0.034 (0.146)	-0.092* (0.055)	-0.002 (0.027)	0.005 (0.020)
Ln(sales 3 yrs ago)			-0.070*** (0.011)					-0.084*** (0.009)		
Geography										
Ln(population)	0.265** (0.104)	0.229 (0.173)	0.007 (0.029)	-0.022** (0.009)	0.014 (0.009)	0.284** (0.116)	0.307* (0.159)	0.016 (0.033)	-0.012 (0.010)	0.017* (0.010)
Landlock	0.179 (0.233)	0.323 (0.345)	-0.032 (0.098)	0.055** (0.025)	0.101*** (0.030)	0.295 (0.239)	0.327 (0.286)	-0.148* (0.078)	0.026 (0.026)	0.027 (0.024)
Infrastructure										
Infrastructure index	0.098 (0.313)	1.287** (0.567)	0.050 (0.112)	-0.079** (0.033)	-0.125*** (0.035)	-0.040 (0.270)	0.606 (0.369)	-0.010 (0.097)	-0.072** (0.034)	-0.133*** (0.032)
Ln(Cost Export)	-0.046 (0.186)	0.159 (0.263)	-0.083 (0.059)	-0.133*** (0.023)	-0.068** (0.029)	-0.269 (0.183)	0.055 (0.209)	-0.088 (0.060)	-0.043 (0.027)	-0.069*** (0.026)
Telecom	-0.151 (0.242)	-0.059 (0.443)	0.044 (0.071)	0.024 (0.020)	0.043 (0.028)	0.159 (0.206)	0.540** (0.228)	0.161*** (0.061)	0.062*** (0.022)	0.061*** (0.017)
Poli & inst. factors										
Ln(party years)	-0.615*** (0.214)	-0.879** (0.410)	-0.123** (0.055)	0.003 (0.012)	-0.003 (0.013)	-0.462** (0.214)	-0.384* (0.226)	-0.069 (0.045)	-0.020 (0.013)	0.014 (0.012)
Any conflicts in 10 yrs	-0.905*** (0.330)	-1.230** (0.615)	-0.067 (0.081)	0.068*** (0.019)	-0.019 (0.026)	-0.880** (0.358)	-0.702* (0.374)	-0.019 (0.078)	0.002 (0.029)	-0.042 (0.027)
Ethnic frac.	-0.822 (0.774)	-2.050 (1.543)	0.035 (0.232)	0.061 (0.050)	0.030 (0.062)	-0.857 (0.678)	-0.205 (0.804)	0.320* (0.172)	-0.073 (0.047)	0.041 (0.045)

Table 9. Determinants of firm performance by industry sophistication (cont'd)

	Low-tech manufacturing					High-tech manufacturing				
	TFP	Ln(LP)	Sales Growth	Export Share	Inv/VA	TFP	Ln(LP)	Sales Growth	Export Share	Inv/VA
Business environment										
Bribe	4.344*	3.044	0.119	-0.432	-0.772**	1.101	-1.349	-0.727	0.041	-0.043
	(2.563)	(3.787)	(1.007)	(0.305)	(0.325)	(2.034)	(1.651)	(0.684)	(0.300)	(0.206)
Obstacle_crime	-0.425	-0.496	-0.058	-0.078**	-0.001	-0.941*	-0.699	-0.355***	-0.032	-0.108**
	(0.364)	(0.581)	(0.096)	(0.036)	(0.060)	(0.483)	(0.506)	(0.096)	(0.045)	(0.048)
Firing difficulty	1.260***	1.535**	-0.241**	-0.005	0.043	0.644	0.584	-0.319***	0.046	0.024
	(0.447)	(0.635)	(0.121)	(0.032)	(0.051)	(0.439)	(0.451)	(0.113)	(0.029)	(0.037)
Competition_ind	-0.468	0.729	0.034	0.127	0.059	-1.545**	-0.463	-0.190	0.151**	0.195***
	(1.248)	(1.604)	(0.246)	(0.110)	(0.193)	(0.688)	(0.722)	(0.204)	(0.063)	(0.073)
Country-ind avg of foreign	-0.554	-2.380**	-0.118	0.303** *	-0.020	-0.302	-0.952**	0.130	0.075	-0.134***
	(0.535)	(1.118)	(0.135)	(0.093)	(0.072)	(0.382)	(0.431)	(0.103)	(0.047)	(0.045)
Tariff	0.942	1.469	0.175	-0.114	0.123	4.783**	3.718	1.948***	-0.455	0.266
	(0.760)	(1.149)	(0.234)	(0.130)	(0.096)	(2.068)	(2.282)	(0.543)	(0.286)	(0.218)
Finance										
Bank	0.339	0.681*	0.067	-0.045	-0.007	0.398	0.466	0.133	-0.051	-0.002
	(0.271)	(0.369)	(0.104)	(0.031)	(0.042)	(0.289)	(0.305)	(0.115)	(0.052)	(0.038)
Trade credit	0.517	0.700	0.166*	0.208** *	0.057	0.377	1.316***	-0.143	0.159**	0.060
	(0.408)	(0.564)	(0.098)	(0.059)	(0.063)	(0.279)	(0.364)	(0.112)	(0.062)	(0.048)
N	4,820	5,777	4,877	6,357	4,521	2,817	3,525	3,069	3,854	2,682
r2_a	0.214	0.317	0.104	0.205	0.029	0.233	0.303	0.143	0.192	0.077

Note. *, **, and *** represent statistical significance at the 10, 5 and 1 percent levels. Intercept not reported. Standard errors are clustered at the country level. Industry dummies also controlled for.

Table 10. Using the sample with the same informality index as Africa

	TFP	Ln(LP)	Sales Growth	Export Share	Inv/VA
Poor Africa	0.831 (0.536)	1.786* (0.945)	0.372** (0.160)	-0.012 (0.031)	-0.007 (0.037)
Geography					
lnpop	0.267* (0.156)	0.252 (0.246)	-0.014 (0.039)	-0.025*** (0.007)	0.008 (0.007)
landlock	0.111 (0.271)	-0.027 (0.389)	-0.070 (0.129)	0.053*** (0.018)	0.111*** (0.022)
Infrastructure					
Infrastructure index	0.921 (0.857)	1.935 (1.368)	0.121 (0.213)	-0.055 (0.050)	-0.113** (0.047)
Ln(cost export)	0.174 (0.337)	0.726 (0.476)	0.014 (0.094)	-0.117*** (0.027)	-0.093*** (0.031)
Telecom	-0.262 (0.261)	0.227 (0.457)	0.089 (0.072)	0.036*** (0.012)	0.054*** (0.018)
Poli & inst. factors					
Ln(party years)	-0.618*** (0.227)	-0.610 (0.378)	-0.130* (0.067)	-0.025*** (0.010)	-0.027** (0.011)
Any conflicts in 10 yrs	-0.929** (0.411)	-1.313* (0.750)	-0.080 (0.100)	0.039** (0.016)	-0.023 (0.020)
Business environment					
Obstacle_crime	-0.269 (0.446)	-0.602 (0.730)	-0.173 (0.120)	-0.015 (0.030)	0.020 (0.040)
Firing difficulty	2.227*** (0.736)	2.314* (1.208)	-0.381** (0.193)	0.050 (0.034)	0.055 (0.035)
Tariff	0.592 (0.750)	1.897 (1.592)	0.350 (0.273)	-0.317** (0.133)	-0.312*** (0.076)
Finance					
Bank	0.347 (0.378)	0.112 (0.420)	0.231* (0.127)	-0.009 (0.026)	0.036 (0.041)
Trade credit	-0.308 (0.440)	0.300 (0.742)	0.048 (0.137)	0.136*** (0.036)	0.025 (0.051)
Other variables: industry dummies, ln(firm age), state, foreign, largest ownership, ethnic frac., bribe, competition_ind, country-ind avg of foreign, and (only for sales growth) ln(sales 3 years ago).					
N	5,583	7,300	6,204	8,080	5,470
Adjusted R squared	0.255	0.342	0.130	0.218	0.030

Note. *, **, and *** represent statistical significance at the 10, 5 and 1 percent levels. Intercept not reported. White standard errors are clustered at the country level. Industry dummies also controlled for.

Only countries within the same range of informality index as Africa are included in the regressions.

The coefficients of “other controls” tend to be very similar to those without limiting the range of informality.

Table 11. Determinants of the growth rate of labor productivity

	Manufacturing				Services	
	Base		With more controls			
Poor Africa	0.323**	0.147	0.405**	0.180	0.191*	0.109
Firm Characteristics						
Ln(firm age)	0.046***	0.009	0.054***	0.008	0.030**	0.015
State	0.236**	0.107	0.237**	0.112	0.175	0.157
Foreign	0.154***	0.034	0.161***	0.032	0.121***	0.037
Ownership largest	-0.073**	0.029	-0.074**	0.030	0.036	0.037
Ln(LP 3 years ago)	-0.137***	0.025	-0.142***	0.021	-0.125***	0.029
Geography						
Ln(population)	0.039	0.034	0.008	0.033	0.016	0.024
Landlock	-0.003	0.091	-0.038	0.070	0.021	0.066
Infrastructure						
Infrastructure index	0.081	0.112	0.159	0.158	0.098	0.089
Ln(CostExport)	-0.052	0.054	0.000	0.084	-0.028	0.056
Telecom	0.021	0.072	0.051	0.055	0.062	0.060
Political and Institutional Factors						
Ln(party years)	-0.177***	0.063	-0.185***	0.062	-0.090**	0.044
Any conflict in past 10 years	-0.216**	0.095	-0.192*	0.111	-0.155**	0.076
Ethnic fractionalization	-0.107	0.239	-0.306	0.293	-0.117	0.156
Business environment						
Bribe	-0.298	0.616	-0.158	0.480	-1.511**	0.768
Obstacle_crime	-0.221**	0.094	-0.397***	0.083	-0.126	0.104
Firing difficulty	-0.011	0.114	0.128	0.174	0.134	0.114
Competition_ind	-0.067	0.151	-0.175	0.128	-0.066	0.138
Tariff	0.269	0.235	0.051	0.164	-0.116	0.660
Country-industry avg of foreign	-0.099	0.101	-0.095	0.078	-0.223*	0.133
Finance						
Bank	0.141	0.093	0.099	0.099	0.138*	0.083
Trade Credit	0.143	0.101	0.009	0.094	0.018	0.119
Other controls						
	no		yes		no	
N	10,143		9,073		6,581	
r2_a	0.185		0.181		0.148	

Note. *, **, and *** represent statistical significance at the 10, 5 and 1 percent levels. Intercept not reported. White standard errors are clustered at the country level. Industry dummies also controlled for.

“Other controls” include the same extra variables as in Table 7.

Table 12. Accounting for performance differences between the Poor African countries and the top half performers of the similar-income sample

	TFP	Ln Labor Productivity	Labor Productivity Growth	Sales Growth	Export Share	Investment/ Value Added
<i>Difference between Africa and the top half performers of the similar-income sample</i>	0.336	-0.133	-0.095	-0.008	-0.137	-0.100
Percent of outcome difference explained by:						
Firm Characteristics		22.9		-865.5		-5.6
Of which:						
Ln(firm age)		19.7	10.6	-72.9		-5.6
State				19.2		
Foreign	4.0	-19.4	-5.6	-60.3	-5.5	
Ownership largest		18.9	8.8	143.9		
Ln(sales 3 years ago)				-895.4		
Geography	-99.9				-19.2	11.0
Of which:						
Ln(population)	-99.9				-19.2	19.3
Landlocked						-8.3
Infrastructure					48.0	37.1
Of which:						
Infrastructure index					-19.6	-45.4
Ln(Cost Export)					17.2	19.2
Telecom					50.4	63.3
Political & institutional factors	-74.5	-20.8	91	710.9		
Of which:						
Ln(party years)	-81.3		96.9	710.9		
Any conflicts in 10 years	6.8	-20.8	-5.9			
Ethnic fractionalization						
Business environment	28.8	8.8		275.2		7.0
Of which:						
Bribe						
Obstacle_crime			21.2	190.3		
Firing difficulty	9.9	-33.0		84.9		
Competition_ind						4.2
Country-ind avg of foreign		41.8			-5.7	
Tariff	18.9					
Finance		252.3			28.1	
Of which:						
Bank	119.6	55.4			-5.9	
Trade credit	387.1	196.8			34.1	

Note. We do not report the effects for some variables (e.g., industry dummies, Africa). When a cell is empty, it means that the coefficient is statistically insignificant from zero or the magnitude is too small (less than 4 percent).

Appendix. The list of countries for each sample
(The numbers in the table are GDP per capita in 2005 U.S. dollars)

Africa					
Angola2006	767.4	Gambia2006	332.7	Mozambique2007	307.8
Benin2009	353.8	Ghana2007	290.3	Namibia2006	2460.2
Burundi2006	109.2	Guinea2006	141.6	Niger2009	170.5
Cameroon2006	692.0	GuineaBissau2006	396.5	Rwanda2006	250.2
Cameroon2009	692.0	Ivory Coast2009	530.1	Senegal2007	522.3
CapeVerde2009	1553.8	Lesotho2009	501.5	Sierra Leone2009	254.1
Chad2009	285.2	Liberia2009	144.4	Swaziland2006	1463.2
Congo2009	1156.4	Madagascar2009	260.2	Tanzania2006	316.3
DRC2006	85.8	Malawi2009	148.4	Togo2009	248.5
Eritrea2009	151.0	Mauritania2006	429.5	Uganda	283.1
The average comparison group (i.e., with GDP per capita < 3000 USD)					
Albania2007	1541.0	Georgia2008	1079.9	Romania2009	2595.5
Armenia2009	1425.2	Guatemala2006	1749.2	Russia2009	2866.3
Azerbaijan2009	1945.6	Honduras2006	1244.9	Samoa2009	1800.0
Belarus2008	2067.6	Kazakhstan2009	2332.2	Tajikistan2008	217.2
Bolivia2006	1039.3	Kyrgyz Rep.2009	352.1	Timor Leste2009	299.7
Bosnia and Herzegovina200	2041.4	LaoPDR2009	450.0	Tonga2009	1659.7
Bulgaria2009	2412.6	Mongolia2009	683.1	Ukraine2008	1037.3
Colombia2006	2955.2	Nepal2009	245.1	Vanuatu2009	1288.0
Ecuador2006	1515.7	Nicaragua2006	818.4	Vietnam2009	617.1
ElSalvador2006	2359.4	Paraguay2006	1346.5	Yemen2010	561.3
Fiji2009	2190.4	Peru2006	2228.3	Uzbekistan2008	725.4
Fyr Macedonia2009	2075.8	Philippines2009	1201.7		
The better comparison group (i.e., with GDP per capita < 3000 USD, and top half in firm performance)					
Albania2007	1541.0	Georgia2008	1079.9	Russia2009	2866.3
Armenia2009	1425.2	LaoPDR2009	450.0	Tajikistan2008	217.2
Bosnia & Herz.200	2041.4	Peru2006	2228.3	Ukraine2008	1037.3
Bulgaria2009	2412.6	Philippines2009	1201.7	Vietnam2009	617.1
Fyr Macedonia2009	2075.8	Romania2009	2595.5		

Note. The “Africa” in the table excludes South Africa, Botswana, Mauritius, and Namibia.