

**FACING THE HEAT: POLITICAL INSTABILITY AND FIRM NEW
PRODUCT INNOVATION IN SUB-SAHARAN AFRICA**

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Abstract

We examine how political instability (PI) affects firms' product innovation and the strategies that firms can employ in response to PI. We argue that while higher levels of PI influence firms' innovation negatively, greater international exposure (through foreign ownership and exporting) can help firms partly overcome this external challenge and innovate. We test these predictions using a dataset of 3,000 manufacturing firms across 15 countries from Sub-Saharan Africa. The empirical results confirm a robust and negative effect of PI on firms' product innovation through several mechanisms. They also suggest that all firms in a country, regardless of ownership structure, are equally affected by PI. Finally, higher levels of exporting weaken the deleterious effects of PI on innovation for both domestic and foreign firms. Our study offers insights into the barriers of innovation in emerging economies and explicates why some firms are more innovative than others in politically unstable contexts.

Practitioner points

- PI has a robust and negative effect on firms' product innovation, irrespective of proxies used to capture various dimensions of both PI and innovation.
- These effects appear to operate via multiple mechanisms such as regulatory stability, reliability of courts but also finance and corruption.
- All firms in a country, regardless of ownership structures, are similarly affected by PI.
- Higher levels of exporting provide an "escape route" for both foreign and domestic firms by mitigating the negative effects of PI on innovation.

Keywords: *Political instability; Firm innovation; Africa; Exporting; Foreign ownership*

1. INTRODUCTION

New product development involves complex interactions between firms' strategies, technological features, and external environmental characteristics (Kahn et al., 2012; Evanschitzky et al., 2012). Subsequently, due to differences in institutions, infrastructure, resources and consumers, innovation in emerging economies differs considerably from innovation in developed countries (Cunha et al., 2014; Ernst et al., 2015; Story et al., 2015; Subramaniam et al., 2015; Anand et al., 2021). One such prominent difference is the level of political instability (henceforth PI) – i.e., frequent changes in government, social unrest, violent conflicts, or regulatory volatility (Alesina and Perotti, 1996; Polacheck and Sevastianova, 2012). Notably, firms in politically unstable countries suffer from greater uncertainty (Delios and Henisz, 2000), higher operating costs (Svensson, 1998) and adverse political patronage (Ghura and Mercereau, 2004).

Prior studies on innovation in emerging economies have focused on the roles of firm capabilities (Bello et al., 2016), collaboration (Kafouros et al., 2015), financial resources (Story et al., 2015) and non-market strategies (Li et al., 2018; Krammer and Jimenez, 2020), without explicitly considering the role of PI on innovating firms in these environments. As such, we have very little insights into how PI (a country-level construct) affects innovation performance at the firm level, and the factors that may help firms deal with such significant challenges stemming from their external environments (Boudreaux et al, 2019; Krammer, 2019). This is surprising given the importance of the macro-context for innovation in emerging economies (Steinfeld and Holt, 2019; Wang et al., 2020), and the role of some of these idiosyncrasies in challenging traditional theories (Govindarajan and Ramamurti, 2011; von Zedtwitz et al., 2014; Subramaniam et al., 2015; Bortoluzzi et al., 2018).

To address this question, we investigate the cross-level effects of politically unstable contexts on firms' *new product innovation* – a crucial ingredient of firm performance and

competitive advantage (Adner and Levinthal, 2001; Li and Atuahene-Gima, 2001; Prahalad, 2012). Extant research on PI has focused exclusively on its macro-level implications, assuming that it affects uniformly all firms in a country (Allard et al., 2012). Drawing on institutional theory (North, 1990; Hoskisson et al., 2013; Ben Ali and Krammer, 2016) and the National Innovative Capacity (NIC) framework (Furman et al., 2002; Krammer, 2009; Castellacci and Natera, 2013), we challenge this assumption and examine how country-level PI influences firms' innovation in the context of emerging economies (Hitt et al., 2007). Our cross-level focus on innovation is motivated both by the paucity of large-scale empirical studies on the consequences of PI for firms (Cummings, et al., 2016; Krammer et al., 2018) and by the importance of new products in emerging economy contexts (Ernst et al., 2015; Liu, et al., 2015; Wang et al., 2020).

Furthermore, we seek to explain why the cross-level relationship between PI and innovation may differ across firms by investigating how certain contingencies affect this relationship. Specifically, we follow prior literature and consider two strategies that may help firms to mitigate the negative effects of PI on innovation in the form of stronger links to foreign parent firms and increased focus on stabler foreign markets (Kafouros et al., 2018; Krammer et al., 2018; Anand et al., 2021). Motivated by these views, we examine whether and how the negative consequences of PI for innovation in Africa are mitigated 1) by “outside-in interactions” through *foreign-ownership* and 2) by “inside-out interactions” through *exporting* (Gaur and Lu, 2007). We argue that international exposure helps firms compensate for the direct negative consequences of PI (Darendeli and Hill, 2016) and for indirect effects in the form of precarious business practices that characterize politically unstable environments (Kesternich and Schnitzel, 2010; Goldbach and Nitsc, 2014).

We test these cross-level theoretical predictions using a dataset of over 3,000 firms from 15 Sub-Saharan African countries. Several reasons make Africa an appropriate empirical

context for our research. First, these countries exhibit significant variation in terms of the level and type of PI, with some parts of Africa routinely identified as the most unstable and endemically violent in the world (Straus, 2012). Second, their strong dependence on natural resources has often amplified the frequency and severity of PI through frequent internal and external conflicts (Ross, 2004; Hodler, 2006). This deficiency reinforces their need to spur innovation as a prerequisite for breaking this vicious circle (Collier, 2007). Finally, compared to other regions in the world, Africa still under-performs in terms of research and development (R&D) investments, scientific output, technical competences, and human capital (Juma, 2005). These deficits are indicative of the unique challenges that firms in this region face when engaging in innovation (Cunha et al., 2014; Barasa et al., 2017; Kraemer-Mbula et al., 2019). Nevertheless, this heterogeneity is beneficial for this research, allowing us to analyze the effects of PI across diverse country contexts and types of firms.

Our study makes three contributions. First, our endeavor goes beyond estimating the relationship between (country-level) political instability and (firm-level) new product innovations. Building on the NIC literature (Furman et al., 2002; Krammer, 2009), we develop a multi-level theoretical reasoning regarding the ways through which country-level PI affects firm innovation (Chrisman et al., 2015). These channels explicate the impact of PI on firms' propensity to innovate through the provision of innovation inputs and resources and also through the multi-level rationales behind firms' decision to introduce new products in these markets (Hitt et al., 2007). This multi-level approach advances our knowledge of how the political context of each country affects firm innovation through various institutional levers (Hillman et al., 2004; Doh et al., 2012; Cumming et al., 2016; Alam et al., 2019).

Second, we contribute to the literature on the antecedents of new product innovation by identifying its barriers and enablers in the context of emerging markets (Li and Atuahene-Gima, 2001; Krammer, 2019), and in the African realm in particular, where there is still a

dearth of research. Although prior work has focused on firm competences (Daneels, 2002) in developed countries (Nadkarni and Chen, 2014), recent studies have emphasized the need for context-specific explanations in emerging economies (Story et al., 2015; Krammer and Jimenez, 2020). We answer these calls by analyzing the under-explored African context (Goedhuys, 2007; Barasa et al., 2017; Steinfield and Holt, 2019) and focusing on a darker, yet critical, institutional feature (i.e., PI) that triggers heterogeneous firm responses and strategies.

Finally, we identify and theorize about two strategic responses that emerging market firms may employ to mitigate the negative consequences of PI for innovation. Specifically, we examine potential benefits stemming from firms' ownership structure and their focus on export activities in coping with political volatility (Witt and Lewin, 2007; Govindarajan and Ramamurti, 2011). In this way, we offer a novel explanation for why some firms are successful at innovating in these contexts (while others fail) and augment an emerging stream of literature on organizational responses in turbulent and hostile environments (Darendeli and Hill, 2016; Oh and Oetzel, 2017).

2. THEORY AND HYPOTHESES

2.1 Innovation in Emerging Economies

Prior research, including the NIC framework (Furman et al., 2002; Krammer, 2009; Castellacci and Natera, 2013), suggests that new product innovation in developed countries is largely driven by continuous, long-term firm investment in R&D and well-developed legal and political institutions that protect the owners of intellectual property from illegal imitation (Lerner, 2009). Developing R&D capabilities is a path-dependent process that requires the accumulation of technological knowledge and diverse skills over a long period of time (Li and Atuahene-Gima, 2001). Strong institutions provide a protective framework, discourage

opportunistic behavior, and subsequently help firms' exploit the commercial potential of their innovations (Krammer, 2015; Alam et al., 2019).

However, the determinants of product innovation in emerging economies differ significantly from those in developed countries (Bortoluzzi et al., 2018). Firms in emerging economies benefit from lower costs and often leverage such cost advantages to develop products with fewer resources, thus offering 'more value for less' (Subramaniam et al., 2015). This point is particularly important because a large proportion of consumers in emerging economies sits at the bottom of the pyramid and has very low disposable income (Prahalad, 2012). As such, prior studies show that the ability of emerging economy firms to develop affordable value innovations is key to their success (Ernst et al., 2015). These firms also benefit from widespread imitation that may lead to path-breaking behaviour and disruptive innovation (Anand et al., 2021). As a result, some innovations that were developed for emerging economies were later successfully introduced in developed countries – a phenomenon known as reverse innovation (Govindarajan and Ramamurti, 2011; von Zedtwitz et al., 2014).

Nevertheless, firms in emerging economies only rarely possess appropriate resources and strong R&D capabilities (Guillen and Garcia-Canal, 2009; Anand et al., 2021). They make smaller investments (and less systematically) in innovative activities and may innovate without investing in formal R&D (Guan, et al., 2009) given the lack of strong intellectual property protection (Zhou, 2006; Park, 2008; Wang et al., 2020). Even for firms that undertake formal R&D, developing innovative capabilities requires a significant amount of time (Alam et al., 2019). As such, firms often need to employ non-market strategies, such as political connections (Krammer and Jimenez, 2020) or even bribes (Krammer, 2019) to ensure their success in terms of introducing new products and services in these markets.

In addition to the significant challenges pertaining to developing and exploiting capabilities (Wang et al., 2020), firms in emerging economies also face the additional challenge

of having to focus on cost efficiency (Bello et al., 2015; Zhou, Gao and Zhao, 2017) by mastering to break down intricate processes and adapting them to the needs of their market (Anand et al., 2021). This is an important feature of innovation in this context, as many customers are not accustomed to (and may resist) paying higher prices for new products and services that are developed in emerging economies or may question the quality of such outputs (Bello et al., 2015).

Moreover, when compared with developed markets, emerging economies such as those in Africa exhibit a higher level of cultural embeddedness and structural differences such as high market heterogeneity, chronic governance problems, unbranded competition, low income, and inadequate infrastructure (Juma, 2005; Radas and Božić, 2009; Barasa et al., 2017; Olaoye et al., 2020). Indeed, prior studies emphasize that firms in emerging economies operate in institutional environments that differ considerably from those in developed economies, and which in turn affect how firms behave and innovate (Kafouros and Aliyev, 2016; Ben Ali and Krammer, 2016). Hence, firms must be well embedded in these environments and adapt to their unique challenges and demands (Ernst et al., 2015) as well as find ways to benefit from any governmental support available to them (Zhou et al., 2017; Lazzarini et al., 2021).

As a result, innovation in Africa differs from innovation in developed countries in the sense that it is based on or triggered by the scarcity of resources, affordability, and niche products (Steinfeld and Holt, 2019). Moreover, from a technological standpoint, it typically targets “new to the firm” or “new to the market” innovations as opposed to those at the technological frontier of the world pursued by firms in developed economies (Goedhuys, 2007; Kraemer-Mbula et al., 2019). Hence, it typically falls in three categories (Zeschky, et al., 2011; Bortoluzzi et al., 2018; Shankar and Narang, 2019): 1) cost-saving innovations that reduce the price of a product offered in developed countries; 2) good-enough innovations that re-engineer

certain basic features to offer a product that is simpler than that offered in developed countries; and 3) frugal innovations are developed uniquely for resource-constrained environmentsⁱ.

In sum, prior studies have recognized that innovation in emerging economies (Africa being a great example in this regard) differs significantly from that in developed economies and have subsequently focused on the different types of such innovations and/or the (lack of) capabilities of emerging economy firms. They have also emphasized the role of the environment, and in particular that of institutions, as a determinant of firm behaviour and innovation. However, despite the importance of the context in which innovation occurs, there is still little knowledge about the mechanisms through which PI affects firm innovation and the ways through which firms in emerging economies can deal with such constraints. The next sections address these questions and develop testable hypotheses on these aspects.

2.2 Political instability and firm innovation

Political instability is a country-level construct that refers to political systems that are characterized by frequent constitutional or unconstitutional changes in government, but also by frequent legal and regulatory changes, social unrest, disorder, military coups, crime, threats (including terrorism) and internal and external socio-political conflicts and tensions (Alesina and Perotti, 1996; Busse and Hefeker, 2007). Subsequently, PI mandates a variety of dimensions and indicators to capture all its facets (Jong-A-Pin, 2009; Kraay et al., 2010). While firms in politically unstable countries face significant challenges, politically stable countries feature better institutions (Krammer, 2019), pro-business reforms (Allard et al., 2012) and competitive environments (Globerman and Shapiro, 2003). These characteristics attract foreign investment (Collier, 2007), foster the development of firm capabilities (Allard et al., 2012) and help firms absorb technological knowledge from abroad (Singh, 2007).

The central tenet of our framework is that firms' propensity to innovate in politically unstable emerging markets is determined by various motives and constraints that are shaped by country-level institutional forces. Accordingly, we draw on research on institutional economics (North, 1990), which postulates that firm behavior is determined by multilevel institutional configurations (e.g., political, legal, regulatory, and normative and cognitive) within each country (Gao et al., 2010; Kafouros and Aliyev, 2016; Krammer, 2018). Following these insights, we conjecture that the political context in each country influences firms' propensity to innovate by affecting the availability, provision and quality of inputs and resources needed for innovation, but also the incentive structures surrounding firms' decision to innovate (Peng et al., 2008). Although certain institutional weaknesses may encourage some firms to innovate (Wang et al., 2020; Zhu et al., 2017), the overarching logic in our study is that political instability at the country level will decrease firm-level propensity to innovate through several mechanisms that are discussed below.

First, country-level PI can intensify certain constraints that firms face when they innovate. Because factor markets and formal institutions in emerging economies are underdeveloped (Wang et al., 2020), firms in such contexts typically engage in corporate political activities (Lawton et al., 2013) and decrease their reliance on external markets. Political ties help firms receive favorable treatment from governments and agencies and provide access to resources and intermediary services (Wang et al., 2012; Rajwani and Liedong, 2015). However, when political instability is high, a firm's previously established political ties become obsolete quickly due to the frequent government changes and significant restructuring (Krammer and Jimenez, 2020). In such cases, changes in government make a firm's existing political ties less useful for innovation. In addition, those firms that are seen as supporters of the previous regime are treated unfavorably by the new regime (Sun et al., 2015), affecting once again negatively firm-level innovation.

Second, access to financial resources as a critical ingredient for firm innovation (Ayyagari et al., 2012) is significantly restricted in politically volatile situations, as banks and investors are more hesitant to give loans due to the higher risk of defaults and inflationary concerns (Wu et al., 2014). Firms may finance their innovative endeavors through public funding using their political ties (Rajwani and Liedong, 2015). However, as political instability at the country level results in unexpected changes in governments and policies, it typically restricts the availability of public funding to firms that are politically connected (Cumming et al., 2016). It thus constrains resources and thereby the overall development of new products and services, particularly for firms that either are not connected or lose their ties due to the frequent changes in the political regime (Darendeli and Hill, 2016).

Third, PI decreases firms' propensity to innovate by affecting the availability of skilled human capital by lowering the quality of education systems in these countries (Schneider et al., 2010) and reducing the scope of internal training in firms (van Uden et al., 2017). These in turn affect how quickly firms can assimilate and create knowledge (Smith et al., 2005), their absorptive capacity (Cohen and Levinthal, 1990) and overall innovativeness (Radas and Božić, 2009). Furthermore, social unrest and violence at the country level makes worker absenteeism in firms a difficult obstacle to overcome, even for securing daily operations (Ksoll et al., 2015). The above challenges are considerable in emerging economies given that such environments are typically characterized by high rates of labor turnover and require firms to continuously engage in hiring high-quality employees.

Fourth, political instability leads to frequent legal and regulatory volatility that de-incentivizes firms that want to invest in innovative activities. Although organizations in emerging economies want to respond to institutional changes, they avoid engaging in innovation until the residual uncertainty is lower (Rodrik, 1991). PI therefore results not only in lower firm revenues but also in the redistribution of funds from riskier longer-term endeavors

such as innovation to less uncertain activities (Cumming et al., 2016). This firm behavior is reinforced when PI increases information asymmetries, making it more difficult for firms in emerging economies to collect the information they need for creating innovations.

Finally, country-level PI can de-incentivize firm-level innovation through the weaker enforcement of laws and less responsive regulatory systems. Formal institutions help firms protect their new products and services from imitation (Furman et al., 2002). In situations of great political turmoil, firms are less able to effectively protect their intellectual property (Gwenhamo et al., 2012) as courts function ineffectively and the enforcement of patent laws is not a priority for governments that usually focus on the causes of instability. Such country-level conditions decrease the potential economic returns that each firm can generate and capture from its innovative activities, thus further de-incentivizing firms to innovate (Krammer, 2009).

In addition to a deficit in terms of enforcement, PI further decreases firms' incentives to innovate by making the interpretation of laws and regulations by government officials inconsistent and unpredictable (Wang et al., 2020). PI increases not only the risks but also the costs involved in innovation because firms either must compete unevenly with other firms that are protected via political connections (Zhou et al., 2017; Krammer and Jimenez, 2020) or compete with informal-economy firms that save on resources and imitate external technologies more freely (McCann and Bahl, 2017; Piperopoulos et al., 2021). In addition, when PI is high, the legislative process is obfuscated by obstacles and bribing norms to perform and speed-up certain bureaucratic processes associated with the introduction of new products. These include getting approvals, ensure timeliness and avoid discriminatory treatment (Krammer, 2019), which together drive up the cost of innovation in these environments.

Building on the above mechanisms, we introduce our first (baseline) hypothesis:

Hypothesis 1: There will be a negative relationship between country-level political instability and firm-level propensity to innovate.

2.3 Differences between domestic and foreign-owned firms

The next premise of our framework is that the adverse effects of country-level PI on firm innovation will be weaker for foreign-owned firms (i.e., subsidiaries of MNEs) compared to domestic firms. International business theory suggests that one of the strengths of MNEs is their ability to transfer advantages, knowledge, and resources across their affiliates (Kogut and Zander, 1993; Kafouros et al., 2018). Building on this view, we argue that foreign-owned firms can partly overcome the challenges associated with political instability by accessing MNE-specific resources and advantages.

First, the negative effects of PI on innovation are weaker for foreign-owned firms because they can exploit the advantages of their parent organizations (i.e., MNEs) to overcome the financial constraints hampering innovation (Kesternich and Schnitzel, 2010). The existence of internal capital in turn influences firms' decision to engage in new initiatives (Cuervo-Cazurra and Un, 2010), including innovation. Cross-financing between MNE affiliates is a common practice, providing capital to affiliates affected by credit crunches and weak financial institutions in politically unstable markets. Although MNE affiliates rely on their parent organizations to compensate for weak financial institutions (Wang et al., 2020), it is more difficult for domestic firms that do not have access to such networks to deal with financial challenges when they innovate.

Second, foreign-owned firms can compensate for weaker domestic markets for human capital and technology in politically unstable countries by relying on the MNEs' internal resources (Mangena et al., 2010) and technologies (Kafouros et al., 2018) to continue pursuing innovation. Likewise, access to a portfolio of affiliates enables foreign-owned firms in politically unstable countries to innovate by combining diverse knowledge and technologies from different markets (Barasa et al., 2017), which is a significant driver of innovation. In such

situations, technology transfer from other MNE affiliates acts as a substitute for accessing technologies in African markets and can help firms overcome weaknesses in internal R&D (Un and Cazorra, 2008). As this practice effectively reduces the reliance of foreign firms on African markets, we expect innovation in such firms to be influenced less negatively by PI.

Third, foreign-owned firms are less affected by less developed institutions in Africa because the dispersion of other MNE affiliates across multiple countries makes the imitation of technology by rivals difficult and costly and prevents competitors from identifying which aspects of technology are most valuable (Kafouros et al., 2012). Research on institutional arbitrage shows that MNE affiliates can innovate in jurisdictions with ineffective legal systems as internal linkages and certain geographic configurations of their portfolios of affiliates substitute for weaker IP protection (Zhao, 2006; Krammer, 2015). Given that these advantages lower the risks of knowledge leakage and imitation, innovation in foreign-owned firms will be less affected by PI (Gaur and Lu, 2007).

Fourth, although political connections commonly result in preferential treatment and resources (Wang et al., 2012), when political instability is high such ties become less advantageous (De Villa et al., 2018) or even a liability when a rival political party assumes power (Darendeli and Hill, 2016; Yu et al., 2019). Although PI affects all firms in some shape or form, given the heavy reliance of domestic firms on non-market strategies (Gao et al., 2010), they are more likely to be affected by PI. In such situations, as Krammer and Jimenez (2020) suggest, political ties and reliance on local institutions can backfire. They may result in organizational inertia, further increasing the firm's reliance on government interventions and creating agency problems (Zhou et al., 2017; Wang et al., 2020). These, in turn, strengthen the negative effects of country-level PI on domestic firms' innovation efforts.

Based on the above reasoning, we expect the negative effects of PI on firm innovation to differ between foreign and domestic firms:

Hypothesis 2: The negative relationship between country-level political instability and firm-level propensity to innovate will be weaker for foreign firms than for domestic firms.

2.4 The effect of exporting

Firms in emerging economies are increasingly looking to enter foreign markets by creating new solutions that are appreciated even by consumers in developed economies (Govindarajan and Ramamurti, 2011; von Zedtwitz et al., 2014; Bortoluzzi et al., 2018). The literature suggests that by exporting their products abroad, firms accelerate their learning and accumulate knowledge. Although firms might need some time to absorb such learning, it can further help firms innovate (Ganotakis and Love, 2011). Prior research also acknowledges that innovation makes exporting more likely to occur and that firms from emerging economies can expand internationally even at lower levels of innovation due to their cost competitiveness (Bortoluzzi et al., 2018).

Building on this view, we argue that “inside–out interactions” in the form of exporting reduce the adverse effects of political instability on firms’ innovation. Higher levels of exporting can serve as an “escape route” (Witt and Lewin, 2007) that enables firms to overcome some of the challenges associated with political instability including various resource constraints and uncertain market demand (Krammer et al., 2018). Accordingly, for several reasons, we expect exporting to help firms that innovate in Africa to deal with the challenges of PI.

First, greater exporting can reduce the negative effects of PI on innovation by helping firms overcome capital and finance constraints. Exporting firms pay higher wages and are perceived to be more successful and productive (Melitz, 2003; Cassiman and Golovko, 2011). International visibility and operations across different countries improve the firm’s status and

legitimacy. They also provide reassurance to home-country banks that the business will survive the political turmoil. Exporting therefore assists firms in accessing funding from domestic banks and in receiving better terms of funding (Goldbach and Nitsch, 2014). It also helps firms access capital through their partners in other countries (Ayyagari et al., 2012). Furthermore, exporting firms not only overcome the finance-specific challenges imposed by political instability but, as prior research suggests, they also have better investment opportunities (Ayyagari et al., 2012) that help them implement innovation initiatives.

A second mechanism through which political instability decreases firms' innovation is by limiting the availability and quality of human capital and technology. Greater focus on exporting reduces such challenges by providing firms with the opportunity to accelerate their learning and collect information from international markets (Salomon and Shaver, 2005; Love and Mansury, 2009). They can also access the technological expertise and knowledge of their foreign partners (Autio et al., 2000; Krammer, 2016) and exploit cross-country technological and institutional differences (Kafouros et al, 2018; Krammer, 2018). Hence, although exporting may not always provide direct access to technology, learning through exporting can compensate for some home-country technological disadvantages. Similarly, although exporting is not a direct substitute for human capital shortages, the learning that occurs through it can compensate for shortages in human capital and R&D expertise in the home market (Govindarajan and Ramamurti, 2011).

Furthermore, as discussed in the previous section, PI makes the economic returns to innovation uncertain, as corruption and ineffective legal systems decrease value appropriation. The innovativeness of exporting firms is less affected by PI because exporting partners help coordination and distribution processes that improve the benefits of innovation (Boso et al., 2013). Similarly, competition in international markets incentivizes exporting firms to engage in innovation to become more competitive (Cassiman and Golovko, 2011). Exporting firms

can also compensate for limited market demand and lower revenues in the home market by selling in international markets with stronger demand (Krammer et al., 2018) and more effective law enforcement systems. Such access further helps firms innovate by identifying and accessing a larger pool of opportunities abroad and introducing suitable innovations in their home markets despite unfavourable conditions (Govindarajan and Ramamurti, 2011). Hence, exporting helps firms in periods of political and economic turmoil (Mangena et al., 2010).

The above predictions do not differentiate between domestic and foreign firms, suggesting that exporting positively moderates the relationship between political instability and innovativeness for all firms. However, building on the view that institutional changes may affect domestic and foreign firms differently (Gao et al., 2010), we further posit that the moderating effects of exporting are more pronounced for domestic firms than for foreign firms. The underlying logic for this prediction relies on two distinct effects that can change how PI influences innovation in such contexts: 1) the network-based advantages of foreign firms vis-à-vis domestic firms (Kogut and Zander, 1993) and 2) the extent to which foreign firms vis-à-vis domestic firms rely on the domestic market and its institutions (Kafouros and Aliyev, 2016).

Although the advantages of exporting can help foreign firms, such firms have already got access to a foreign network of affiliates and to the resources of the parent MNE (Mata and Portugal, 2002). Hence, although they can use exporting to overcome some of the challenges of PI, the relative advantages of exporting will be stronger for domestic firms that do not have alternative access to foreign networks (Mangena et al., 2010). Put differently, as domestic firms do not enjoy such ownership advantages, they benefit more strongly from exporting to compensate for the inherent challenges of PI. Prior research has also suggested that because domestic firms are less able to access foreign networks, they must rely more heavily on the domestic market and its institutions to achieve their strategic objectives, including innovation (Krammer et al., 2018). This point once again suggests that the relative advantages of exporting

will be more pronounced for domestic firms than for foreign firms that have access to such networks (Gao et al., 2010). Hence, although we expect both foreign and domestic firms to benefit from exporting, we expect the moderating effects of exporting to be stronger for domestic firms than for foreign firms. The above reasoning leads to our last two hypotheses:

Hypothesis 3a: Exporting will reduce the negative effects of country-level political instability on firm-level propensity to innovate.

Hypothesis 3b: The positive moderating effects of exporting will be stronger for domestic firms than for foreign firms.

3. METHOD

3.1 Data sources and sample

To test our predictions, we employ a multi-level dataset that combines firm-level data from the Enterprise Surveys (ES) developed by the World Bank with country-level data from secondary sources. These surveys comprise face-to-face interviews with top managers and business owners and cover different business topics like finance, corruption, crime, infrastructure, and competition. They take the form of a standardized questionnaire using stratified sampling techniques which ensure a representative coverage for any given country and make ES particularly useful for international comparisons of firms (Bigsten and Söderbom, 2006; Wang and Libaers, 2016; Krammer, 2021). Nevertheless, after considering the limitations of these surveys (e.g., no or false responses to the questions on corruption; Jensen, Li and Rahman, 2010), we have further investigated the distribution of missing observations across variables and countries to check for biasesⁱⁱ. Given the results of this analysis and our focus on questions that are not politically sensitive (e.g., firm size, performance, innovation, etc.), we are confident that the data are unbiased because of PI or oppressiveness of certain African regimesⁱⁱⁱ.

Specifically, we use ES data on Sub-Saharan Africa collected in the period 2006 to 2007 because this round of surveys provides data on new product innovations (goods and services) in this context^{iv}. Given that our hypothesized relationships are less likely to vary considerably over time, and the fact that the within-country correlation of PI levels is 0.88 between 2007 and 2019, we concluded that using this older iteration of ES is appropriate. The entire ES sample for this region consist of 4,737 firms across 15 countries, namely Angola, Botswana, Burundi, Democratic Republic Congo (DRC), Gambia, Guinea, Guinea Bissau, Kenya, Mauritania, Namibia, Nigeria, Rwanda, Swaziland, Tanzania, and Uganda. These countries exhibit significant heterogeneity in both innovation performance and political instability. After removing all missing observations for our main variables of interest, we are left with a sample of 3,014 firms. In terms of our main variables, 15.3% of firms engage in exporting and 10.8% are majority foreign owned (more than 50%). The average firm size (i.e., number of employees) is about 50 and most of these (80%) firms are below this threshold (i.e., SMEs). In terms of age, the average is 13 years and almost half of firms (1,498) are young (less than 10 years).

3.2 Measures

3.2.1 Dependent variable

Following prior studies (Goedhuys, 2007; Fritsch and Görg, 2015; Wang and Libaers, 2016; Krammer, 2019), we measure firm propensity to innovate using the question “*During the last three years, did your establishment: introduce into the market any new or significantly improved products?*” We compute a binary dependent variable (Product innovations), which takes the value of 1 for positive (“yes”) answers, and 0 otherwise. Given the nature of our context (i.e., emerging markets in Sub-Saharan Africa) the types of innovations captured by these measures will likely be “new to the market” or “new to the firm” as opposed to “new to the world” which typically occur in developed countries (Goedhuys, 2007; Kraemer-Mbula et al., 2019).

3.2.2 Independent variables

Our measure for PI comes from the World Bank's Governance Indicators (WGI) and captures the level of political stability as well as the absence of violence and terrorism in a country. This measure has been widely used in prior studies (Globerman and Shapiro 2003; Kauffmann et al., 2008; Allard et al., 2012) as it captures the perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism. Computationally, it combines 11 factors (from terrorism, civil unrest, ethnic and religious conflicts to international tensions, autonomy, or segregation protests) from different sources into a meta-analysis from which they derive aggregated (country-level) values for political stability (details on how the index was computed by the WGI team is provided in **Table B1, Appendix B**, while a complete methodological discussion is provided in Kraay et al., 2010).

The values of this index are normally distributed, i.e., between -2.5 (very unstable) and 2.5 (very stable). Given our interest in the reverse of this issue (i.e., political *instability*), we recode this variable inversely and we add 2.5 to all values to get a positive and continuous scale from 0 (perfectly stable) to 5 (highly unstable countries). To avoid potential simultaneity bias with respect to the measures of innovations (recorded in 2006 and 2007) and prevent outlier effects by looking only at PI values in one year, we take the average of this indicator for the period of proceeding our DV (namely 2000 to 2004)^v.

Firms' exporting (*exports*) is measured as a share of exports in the total sales, summing up the percentage of direct exports with the percentage of indirect exports, derived from two questions in the ES. *Foreign ownership* is measured as a dummy, which equals 1 if the firm is majority owned (i.e., 50% or more) by a foreign entity (either individual, private, or state). Conversely, firms that have between 0 and 49.9% foreign ownership are considered as *domestic*. About 10.8% of firms are foreign owned and among the domestic ones the average

foreign participation is about 1.24% and 96.65% of the domestic firms (N=2,660) have zero foreign ownership.

3.2.3 Controls

To account for idiosyncratic effects between different industries in terms of their natural propensity to introduce product innovations (i.e., mature, low-tech, and concentrated industries have a slower pace of technological innovation than young dynamic and high-tech ones), we include industry dummies in all our estimations (unreported due to space constraints). Moreover, we include a wide range of firm-level and country-level controls which have been documented extensively in the literature to affect firms' innovative performance (Lederman, 2010). Among them, *firm size* measured as the total number of employees at the end of the year before the survey (Fritsch and Görg, 2015), *firm productivity* computed as the logarithm of sales divided by the cost of labor (Melitz, 2003), *firm age* as a proxy for experience and accumulation of knowledge (Goedhuys, 2007; Huergo and Jaumandreu, 2004), *export propensity* (Cassiman and Golovko, 2010), firm's *reliance on skilled labor* (Gorodnichenko and Schnitzer, 2013), total *number of competitors* it faces, as well as its *foreign competitors* (Aghion et al., 2005). We also control for *manager's experience* (Balsmeier and Czarnitzki 2014) and *state ownership* (EBRD, 2014) as two other common drivers of firm innovation.

We also control for country-level characteristics that might drive a firm's propensity to innovate, such as the existing stock of knowledge in an economy measured using patents granted in the US (Furman et al., 2002), *GDP per capita*, as an universal control for market size, wealth and generic quality of institutions, *FDI stock* (Gorodnichenko and Schnitzer, 2013), the strength of *IPR* (intellectual property rights) protection (Park, 2008), *human capital* available (Barro and Lee, 2010), and the existing *political constraints* in a country (Henisz, 2000). **Table 1** provides an overview of all the variables, sources of data, and measurement details.

---- INSERT TABLES 1 AND 2 HERE ----

Table 2 provides descriptive statistics. On average, 50% of all the firms introduced new products or services in the previous three years, and 15% of the firms were involved in exports and 11% of the firms were majority-owned by foreign entities. On average 5.5% of a firm's sales are exported and the degree of foreign ownership in our sample is relatively small (0.14) consistent with the African picture regarding inward FDI. The propensity to introduce product and service innovations is higher for exporting firms (64 percent) than non-exporting firms (48%), also for foreign owned (54%) vis-à-vis local ones (50%). The correlations between our main variables of interest are within acceptable limits (see **Table 3**).

---- INSERT TABLE 3 HERE ----

Table A1 and **Table A2** in **Appendix A** present some contextual nuances of our empirical setting. Thus, the most affected countries by PI and violence are DR Congo, Burundi, Angola, and Rwanda, which is consistent with firms' perceptions of PI expressed in the ES questionnaire. Foreign ownership is highest in countries where PI is less severe (Botswana, Swaziland) but there is a strong presence even in those nations, likely due to their natural resource endowments (UNCTAD, 2018). Export-wise, manufacturing firms from more stable countries (Kenya, Swaziland, and Namibia) tend to be more active in this area.

In terms of distribution of the sample over different industries (**Table A2**), most observations come from food industry, garments, wood, and metal products. Overall, a large portion of firms appear to introduce new products (53%), which is consistent with the subjective definition of newness in this survey, reflecting new-to-the market or new-to-the-firm innovations as opposed to new-to-the-world that usually firms in developed nations are producing^{vi}. In terms of foreign ownership, it is concentrated in resource- and labor-intensive industries where Africa presents comparative advantage for incoming FDI. Overall, exporting appears to be dominant in several industries like Electronics, Chemicals and Non-metallic

Minerals, while PI appears to be uniformly perceived by firms across different industrial sectors. Finally, African MNEs are more prominent in the non-metallic minerals sector (11% of all firms active in this area).

3.3 Common Method Bias (CMB)

We have taken several measures to reduce the risk of CMB. First, the main explanatory variable (PI) is derived from secondary data sources that are not related to ES. Second, the ES has embedded in it a few procedural remedies (e.g., anonymity of responses and firms; a good separation in terms of different sections for innovation questions versus firm specific questions) that further reduce the risk of CMB. Finally, we have performed statistical checks to ensure that CMB is not an issue. The results of a Harman's one factor test suggest that more than one factor are responsible for bulk of the variance in our variables (e.g., six factors in our entire model have Eigen values greater than 1 and jointly they explain about 69% of the total variance). The highest factor in terms of Eigen values can explain only 19% of the overall variance. In addition, we have performed a common latent factor analysis (Podsakoff et al., 2003) which employs confirmatory factor analysis to compare a theoretical model versus one in which all explanatory variables load onto a latent common factor. In our case, the model with additional latent common factor (Chi-square = 9900.85; df=77) performs slightly better compared with the theoretical model (Chi-Square=10293.94; df=78). However, the common factor can explain only about 1.21% of the variance, while other variables do considerably better, e.g., firm size- 13.78%; firm performance- 28.12%; human capital- 2.11%. These results suggest that CMB is not a salient issue in our study.

3.4 Estimation method

Given that we are interested in explaining a firm's probability to innovate as a function of both country-level and firm-level predictors, we opt for a multi-level estimation technique which

accounts appropriately for cross-level effects by estimating both within- and between- variance simultaneously (Bryk and Raudenbush, 2002). We employ a random-intercept mixed-effects (or hierarchical) multilevel probit regressions (*meprobit* command in Stata)^{vii}. Specifically, we have modelled each firm *i*'s innovation within a given country *j* (Snijders, 2011; Hitt et al., 2007; Boudreaux et al., 2019). Thus, firms (level 1 units) are nested in within countries (level 2 units). We apply the following econometric model:

$$Innov_{irc} = \beta_0 + \sum_{h=1}^s \beta_h x_{hirc} + E_{irc} + C_{0r}$$

where *Innov* is the binary dependent variable -firm product innovation for a firm *i* operating in a region *r* and country *c*. The β_0 is the intercept, β_h are fixed effects (or “regular” regression estimated coefficients, and x_{hirc} are independent or explanatory variables in our model. E_{irc} are firm (level 1) residuals, while C_{0r} are random-effects accounting for firm variation within countries. The interclass correlation coefficient (ICC) obtained using an “empty” mixed-effects probit model (i.e., without any covariates) show that about 17.99 percent of the variance in our DV is explained at the country-level, in comparison to 28.94 percent at the firm-level. Together with the results of the likelihood ratio test (Chi2 (2) = 125.75, p<0.000), these suggest that multi-level mixed regression is preferable to a regular probit estimator. Nevertheless, for robustness purposes, we also test the hypotheses using other estimators that are designed to tackle empirical issues such as endogeneity (see section 4.3).

4. RESULTS

4.1 Main results

Table 4 reports the main results using a multi-level mixed probit estimator. We start with a benchmark specification in Model 1 which includes all level 1 (firm) and level 2 (country) control variables. Thus, firm size, reliance on skilled human capital, and to a lesser extent,

competition from local and foreign players are associated with product innovation, in accordance with previous findings in the literature (Aghion et al., 2005).

----- INSERT TABLE 4 HERE-----

With respect to the hypotheses, Model 2 formally tests H1. The coefficient of PI is negative and statistically significant in accordance with our expectations. This effect remains negative and highly significant throughout the rest of the specifications. Model 3 tests H2; namely, the moderating effect of foreign ownership. The interaction of foreign ownership with PI is positive but is not statistically significant. Model 4 examines H3a. The interaction between PI and exports is positive and highly significant, supporting a positive moderation from export intensity which mitigates some of the negative effects of PI on firm new product innovation.

In the remaining Models (5, 6 and 7) we test H3b; namely, that exporting will be more beneficial for domestic firms than foreign firms. We do so by including a triple interaction between exporting, PI, and foreign ownership (Model 5). The results using a triple interaction fail to confirm whether the differences are significant between domestic and foreign firms (the coefficient of the triple interaction is -0.09 but is not statistically significant). Nevertheless, upon a closer investigation, the high VIF value of this specification (8.27), and especially around the interactions factors both at the 1st and 2nd levels suggest that multi-collinearity is affecting these results. As such, we split the sample and formally test the two coefficients of the exports and PI interaction (Models 6 and 7). The interaction effect between PI and exports is positive but insignificant for foreign owned firms (Model 6). However, it is positive and weakly significant for domestic ones (Model 7), which is in line with our predictions. Furthermore, the coefficient is slightly higher in the latter case, indicating that there might be differences in terms of benefiting from export intensity between domestic and foreign firms. To test this effect, we perform a propensity score matching (PSM) exercise, which is described in the robustness tests section. Overall, this salient test appears to invalidate H3b. Hence, the

benefits from exporting appear to be indistinguishable from a statistical point of view between comparable domestic and foreign firms.

To further illustrate these effects, we have plotted them using the command *margins* in Stata. These graphical representations confirm the intuition behind the regression coefficients. Specifically, when PI is low to moderate, African firms that do not export appear to have a slightly higher propensity to introduce new products (**Figure 1**). This finding is consistent with the idea of extra resources and slack available to non-exporters, compared to exporters that must deal with liability of foreignness (Ksoll et al., 2015). This view holds until high levels of political instability (above 4), but this propensity of non-exporters then drops drastically below that of exports. As the degree of political instability increases, these firms will be more exposed to demand shocks, capital, and human shortages, which will take a toll on their innovation performance (from an average 0.72 probability to product innovations when PI=1 to only 0.41 when PI=5). In turn, while exporters are on average less likely to introduce new products in domestic markets that are stable (0.42), they will be more likely to do so when instability in home markets is higher (0.17 for firms with 100% of sales from exports and 0.4 for those with 50 percent), as they will be able to rely on demand from foreign markets and finance their activities through external sources of capital.

---- INSERT FIGURE 1 HERE ---

Finally, it is worth noting that the direct effect of export intensity on firm innovation is negative. At first, this result may seem at odds with some of the theoretical insights from the learning by exporting literature. Nevertheless, there are a couple of explanations for this finding. Firstly, theoretically, from a resource-based perspective, as a firm invests more and more into penetrating new markets (i.e., increase sales from foreign markets), it is likely that it will do so at the expense of other activities such as innovation, particularly in scarce resource contexts such as emerging markets like Africa. Therefore, having this inverse relationship is

very likely. Further, similar findings by previous empirical studies on African firms (Lorenz, 2014; Abu-Danso and Abbey, 2020; Abubakar et al. 2019) require more investigation as per determining the factors behind this negative correlation. Some of the potential hypotheses proposed in the literature emphasize the role of asymmetric competition effects (Aghion et al., 2018), as well as the type of products developed and their position in the global value chains (Yang, 2018)^{viii}. Secondly, in our context we have further examined the existence of non-linear relationship, which would suggest an optimal level of export intensity for spurring innovation. Our results support a non-linear relationship (i.e., positive for firms exporting up to 30% of their total sales, and negative thereafter^{ix}) which emphasize the complex nature of this relationship and present some interesting avenues for further research on African firms.

4.2 Exploration of underlying mechanisms

In our theoretical development, we postulated that PI would influence firms' probability to innovate through several mechanisms, e.g., corporate political activities and building up political capital, rapid and drastic institutional changes, economic uncertainty, loose enforcement of existing rules, poor access to finance/loans, and limited access to foreign technologies. To explore these mechanisms, we have attempted to measure these channels using additional information from the Enterprise Surveys. Specifically, we have screened all survey questions available and identified several variables that capture some of the mechanisms discussed in our theoretical framework (**Table A4**, Appendix A). To explore these effects empirically, we have employed structural equation modeling (SEM) and developed a mediating model in which PI affects firm innovation through these potential mediators (**Figure A1**, Appendix A). Despite data limitations and the exploratory nature of this exercise, the model provides a relatively good fit (Chi-Square = 768.022, df. =66, p=0.000; RMSEA=0.083, CFI= 0.371, SRMR= 0.072). The direct effect of PI on firm innovation is -.070 (p<0.000) while the indirect effect is -.023 (p<0.000), resulting in a total effect of -0.93. Overall, we can identify

that PI works through several channels including obstacles to the business environment in these countries (e.g., functioning of courts, informal competition, macro-economic policies, access to finances or corruption) and firm-specific choices (e.g., technology licensing, upgrading of production standards, subcontracting of production) which then relate back to a firm's propensity to introduce new products in these markets.

4.3 Robustness checks

To test the robustness of the findings, we have performed several checks by using alternative estimation techniques and measures of PI, firm innovation, and other variables. First, following prior studies (Lederman, 2010; Krammer, 2019), we model firm innovation in the form of new products and services using a probit model with standard errors clustered at the country level to control in a different manner for nesting in the data. The results (**Table 5**) are consistent with the main multi-level analysis with some minor improvements in terms of statistical significance of some of the reported coefficients.

Second, prior literature provides a strong rationale that exporting is not a randomly occurring characteristic among firms but rather one that depends on their productivity and performance levels (Cassiman and Golovko, 2011). This result is supported by empirical testing of endogeneity of export status when instrumented (Wald = 39.82)^x. Given these issues, we instrument a firm's export status with its productivity (measured as the ratio between its sales and expenditures on labour and capital) and the industry-city averages of export rates in its industry-city unit, minus those of the focal firm itself^{xi}. If the endogeneity of export propensity is specific to firms and certain industries or geographic specificities, then netting out this firm-specific component yields the exogenous components of exporting, which will be uncorrelated with both PI and firm innovation (Fisman and Svensson 2007; Desai and Olofsgard, 2011; Krammer, 2019). We also test successfully (Anderson-Rubin Chi-Sq. (2) = 48.04, $p < 0.000$) the strength of the instruments using the method developed by Finlay et al.

(2013). The second-stage results of the IV probit are presented in **Table 6** for testing the relationship between exporting, PI, and firm innovation^{xii}.

Third, given this endogenous choice of exporting at the firm level, one other alternative for controlling for it is to allow for self-selection of firms into exporting status and then run the innovation regressions. We do so by employing a Heckman selection procedure where we run a probit model in the first stage. We thus model a firm's propensity to export (i.e., whether it will or not) as a function of its productivity (Melitz, 2003), regional export unobservable effects (in the form of the average propensity of firms to export in the city where the firm is located, minus the focal firm itself) and firm specific effects (e.g., firm size and age). All these factors are highly significant (at the 1% level) and have a positive impact on firms' propensity to engage in exporting, thus confirming these predictions. Subsequently, we compute an Inverse Mills Ratio (IMR) using this estimation. We use it as an additional control variable in our main estimation regarding the impact of exporting on firm innovation (**Table 7**). Results are again supporting our main conjectures.

Fourth, to examine H3b more formally, we need to examine comparable samples of foreign and domestic firms. To tackle this concern, we apply the Propensity Score Matching (PSM) technique (Guo and Fraser, 2014). In the choice model, we use a logit estimator to calculate the probability of a firm falling into the treatment sample (i.e., being foreign owned) versus the control sample using firm size, age, and industry identifiers as part of our matching technique when generating the propensity scores. We apply the Nearest Neighbour Matching technique without replacement using a conservative calliper of 1 percent. PSM results are reported in **Table A5** (Appendix A), and they confirm that there are no statistical differences between domestic and foreign firms in terms of the moderating effect of exporting.

Fifth, we also perform robustness checks by using alternative proxies for political instability, firm innovation, controls, as well as employing continuous measures for our

moderators. Most of these additional tests are not reported in the article but are available upon request from the authors. Notably, we also examine several forms of PI, extracted from different data sources and components of the aggregated PI index included in the World Governance Indicators (**Table A6**, Appendix A). They exhibit different manifestations of PI and may take milder forms of political instability, such as namely government change (Aisen and Verga 2013) to more dramatic events such as the number of battle-related deaths (Weinstein and Imai 2000). Overall, the findings regarding the effect of PI on innovation remain unchanged. These proxies have significant and negative effects on firm innovation. Their marginal standardized effects are reported in **Table A7**. These results show the varying magnitude of PI effect pending on the proxy selected and point out the heterogeneity of the proposed moderators for different types of PI.

Furthermore, we have considered alternative measures for our DV. We specifically use patents, which is one of the most widely used proxies for innovation. More recent Enterprise Surveys (2010-2011) include questions on whether firms have any patents at home (a) or abroad (b). Unfortunately, in the Sub-Saharan Africa, only six countries have these questions in their respective surveys (i.e., Angola, Botswana, Burkina Faso, Cameroon, DR Congo, and Mali). After removing missing observations for all variables of interest, we are left with around 400 firms in our sample. We ran the baseline probit models using these new DVs (i.e., whether have patented at home and respectively, abroad). The results (**Table A8** in Appendix A) confirm a strong negative effect of PI on patenting at home by firms but no effect on patenting abroad, consistent with the theoretical tenets of this article. Greater exporting appears to mitigate the negative impact of PI, and only in the case of patenting at home, again consistent with our theoretical conjectures and prior results using new product introduction.

We have also checked the results against other control variables that are relevant but have limited availability. Specifically, the number of domestic patents in these countries as a

more relevant proxy for their innovative capacity than the stock US patents, from the WIPO statistics (<http://ipstats.wipo.int/ipstatv2/index.htm?tab=patent>) that are available for only four sub-Saharan countries. We have also controlled for the other dimensions of WGI indicators from Kaufmann et al. (2008) in separate regressions^{xiii}. Moreover, under the assumption that PI perceptions might be influenced by whether a country is in an electoral year or not, we have checked the results against this possibility. Four countries (i.e., Nigeria, Democratic Republic of Congo, Namibia, and Uganda) were in an electoral year when the Enterprise Survey was administered. Upon inclusion of a dummy variable for these countries, the main results hold successfully.

5. DISCUSSION AND CONCLUSION

5.1 Theoretical contributions

Using the emerging-economy context of sub-Saharan Africa, the overarching contributions of this study lie in demonstrating how country-level PI influences the innovativeness of domestic and foreign-owned firms, explaining why such effects vary across firms, and identifying ways in which firms that operate in Africa can overcome such challenges and innovate. As such, this study makes three specific contributions.

First, our analysis goes beyond merely estimating the effects of PI on firm innovation by developing multi-level theoretical reasoning that clarifies the ways through which PI (a country-level construct) influences innovation performance at the firm level. Our reasoning clarifies not only the resources that firms in politically unstable contexts need but also the incentives that may change their decision to engage in innovative activities. The study therefore contributes to the literatures on national innovation capacity (Furman et al., 2002), non-market strategy (Hillman et al., 2004; Doh et al., 2012) and turbulent environments (Allard et al., 2012; Darendeli and Hill, 2016) by deepening knowledge of the ways in which country-level

institutions (and the political context in particular) matter for explaining firm-level outcomes (i.e., thus providing a multi-level explanation for firm innovativeness).

Second, the study contributes to a growing body of literature on the enablers and barriers of firm innovation in emerging economies, and particularly Africa, where there is still a dearth of research (Evanschitzky et al., 2012; Kahn et al., 2012; Krammer, 2019; Wang et al., 2020). The few studies that have attempted to explain innovation outcomes in emerging economies focused on the roles of firm capabilities (Bello et al., 2015), collaboration (Kafourous et al., 2015), petty corruption (Krammer, 2019), political connections (Krammer and Jimenez, 2020) and government affiliation (Zhou et al., 2017; Wang et al., 2020). We complement these explanations by showing how country-level factors of political nature in general and PI in particular influence firms' propensity to innovate. The usefulness therefore of this contribution lies in clarifying why PI results in heterogeneous innovation outcomes across emerging economies (all of which typically feature under-developed formal institutions). Hence, such multi-level analysis provides a more nuanced understanding of why firms in some African countries are more innovative than firms in other African countries.

Third, the study explains how certain contingencies associated with international exposure help firms innovate in environments that are unfavorable to innovation. It thus contributes to institution-based perspectives (North, 1990; Hoskisson et al., 2013) that postulate that institutions determine firm behavior by affecting the challenges that firms face, but do not explain how firms can overcome such challenges. Our study extends such perspectives by identifying the ways through which firms mitigate the negative effects of PI on innovation. Hence, it complements macro-level explanations about the effects of PI (Waguespack et al., 2005; Allard et al., 2012) and augments work on exporting and ownership (Salomon and Shaver, 2005; Gaur and Lu, 2007; Krammer et al., 2018) by demonstrating their moderating role in determining the effects of PI on firm innovation.

Our theoretical analysis postulates that there should be an asymmetric pattern of effects, suggesting that PI should affect domestic and foreign-owned firms differently and therefore should lead to different innovation outcomes. Interestingly, however, the empirical results reveal that both domestic and foreign firms are similarly affected by PI. This insight contradicts the view that countries develop their institutions in a way that favours domestic firms, while contributing to the debate in international management on whether foreign firms are affected differently than domestic firms by institutional contingencies (Mata and Portugal, 2002; Gao et al., 2010; Kafouros and Aliyev, 2016). However, although both foreign and domestic firms are equally affected by PI, greater focus on exports (i.e., higher reliance of firms on exporting for their overall sales) provides both types of firms an effective avenue to mitigate the negative consequences of PI.

5.2 Practical and managerial implications

The study bears implications for governments and managers who seek to understand how they can improve firm innovativeness in emerging economies such as Sub-Saharan Africa. First, while these contexts are characterized by various challenges for innovating firms, political instability represents an additional obstacle that further reduces firms' propensity to introduce new products and services. Managers must therefore find ways to manage the adverse consequences of PI more effectively. Although political instability influences firm innovativeness through different ways, our analysis shows that such negative effects can be moderated by increasing a firm's exporting activities, particularly in countries that can help them advance their learning and compensate for home-market shortcomings.

Second, political connections and networks are often seen in the literature to facilitate innovation in emerging markets (Krammer and Jimenez, 2020). Our results emphasize the other side of such non-market strategies by documenting a persistent and negative effect of political instability on firm innovation. In such volatile environments, an otherwise valuable

political affiliation might become a liability when instability is pervasive as prior qualitative studies have also shown (e.g., Darandeli and Hill, 2016). This view differs considerably from the suggestion, often made in literature on emerging economies, that engagement in corporate political strategies is mandatory for success.

In terms of implications for policy, our study offers insights into boundary conditions that can help policy makers reduce the negative consequences of political instability. Specifically, it provides evidence of an additional benefit of exporting in the form of hedging against PI. This adds up to the long list of benefits in stimulating domestic firms to diversify and venture internationally to learn, get experience, and adopt new technologies and products in their portfolio. Our analysis suggests that still, in the context of Sub-Saharan Africa, most firms remain purely domestic and engage in minimal innovation activities (i.e., developing new products, processes or investing in R&D). Thus, stimulation of export activities can have many benefits for these countries, particularly in conjecture with generic efforts to improve their national innovation capacity (Furman et al., 2002; Krammer, 2009) through investments in human capital and infrastructure, or through regulatory upgrades.

5.3 Limitations and future research

Certain aspects of this research warrant further investigation. First, data limitations for Sub-Saharan nations have forced us to rely on binary measures of innovation that provide generic approximations of a firm's activities and do not distinguish the volume and nature (new to the market vs. new to the world) of these innovations. Superior innovation measures (e.g., percentage of sales coming from new products, degree of newness etc.) could allow future research to examine how PI influences the volume and quality of innovation. Equally, we have employed data from older iterations of ES to maximize our coverage of firms in Sub-Saharan Africa, relying also on the fact that the level of PI within a country does not change very quickly over time^{xiv}. As new iterations of ES are introduced, future research can examine whether the

relationship between PI and firm innovation has changed over time (and in what way) or looking at other aspects of firm performance such as growth, survival, and profitability.

Second, the limited availability of innovation-related questions in the ES (in only 15 out of 50 countries), their dichotomous nature and missing observations (high for some variables^{xv}) are limiting factors for large scale, empirical inquiries in this area. Future research on African nations will benefit from updates in the ES by the World Bank that would develop richer, newer measurements for innovation, with high response rates, and including also other Sub-Saharan nations that were not covered in previous rounds. Availability of larger panels would reduce any potential biases from coverage limitations and open avenues for examining the dynamic effects of PI^{xvi} (e.g., medium and long-term effects of innovation on firm performance).

Third, we have used SEM analysis to examine potential mechanisms through which PI affects firm innovation drawing on existing information in the Enterprise Surveys. Taking stock of the limitations in terms of causality and error measurement given that these are all perception-based measures, we found that PI is affecting the overall institutional environment and operating environment for these firms (through the stability of laws, reliability of courts but also finance and corruption) and their incentives as well (by making subcontracting more appealing, reducing engagement in technology licensing, and acquiring of quality standards). Research that will use more detailed data has the potential to offer new insights into the intricate channels through which PI affects firms in each country and identify the mechanisms that matter the most.

Fourth, given the multidimensional nature of our main construct (i.e., PI) it falls under the debate in the field on the use of formative measures (Edwards, 2011). Thus, while such measures present intuitive appeal and straightforward operationalization by combining different measures of concepts into an aggregated one, they are subject to potential drawbacks

such as dimensionality choices, internal consistency, identification, measurement error, construct validity, and causality (Aguinis and Edwards, 2014). In the case of PI, and more broadly the WGI Indicators that have been widely used by researchers from social sciences, this implies a careful consideration of all the dimensions considered (listed in **Table B1**, Appendix B) as well as validation of this formative model using additional tests (Edwards, 2001; Podsakoff, Shen, and Podsakoff, 2006). While this exercise goes beyond the mandate of this work, future contributions in this literature may examine this specific issue, to refine existing or propose new such aggregate indicators that would be exempt from these caveats of formative measures.

Fifth, future research should consider the role of other contingencies that may change how PI affects innovation. For instance, one set of contingencies can involve different types of distance (political, cultural, geographic, or economic) and examine their consequences for foreign firms' ability to cope with political instability. Given the lack of data for the nationality of foreign owners, we were unable to tackle such distance-related effects that may influence international activities. Furthermore, given that firms innovate not only by relying on their internal capabilities but also by collaborating with other domestic and foreign firms (Hashai et al., 2018; Krammer, 2018), a second set of useful contingencies may include the different types of collaboration and technology licensing. Such interactions are particularly important for firms in Africa that are at an early stage of technology development. Lastly, another contingency that provides a useful opportunity for future research concerns the role of FDI in Africa both as a resource-seeking activity of both Western and Chinese MNEs and a vehicle for technology diffusion.

Finally, the limitations of the ES data (e.g., dichotomous questions) pose additional challenges for testing common method bias and the richness of statistical inferences. Future research should better capture (e.g., using continuous variables) firm-level efforts in terms of

R&D as well as ownership statistics by origin (rather than a blunt foreign-domestic distinction). While in the African context, anecdotal evidence and prior studies suggest that there is a lower reliance on formal R&D (Goedhuys, 2007; Barasa et al., 2017; Steinfield and Holt, 2019), it is important to validate this point. Related to this, prior research that used these surveys has suggested that certain questions (e.g., related to firms' involvement in corrupt behaviours) are susceptible to certain biases arising from the type of political regimes in place (Jensen et al., 2010). While in our case, the survey questions we employ (e.g., innovation, performance, and standard firm metrics) should be free of such biases, further studies on political factors (particularly those using perception-based indicators from managers) should pay careful attention to these types of potential interferences.

In conclusion, we demonstrate the deleterious effects of political instability (across different manifestations) on firms' probability to introduce new product innovations in Sub-Saharan African countries. We explore the ways through which PI may impact firm innovation both theoretically and empirically. Moreover, we propose and test empirically the mitigating effect of foreign ownership and exporting as potential "escape routes" for firms seeking to innovate in these environments. We find no differences regarding the effects of foreign ownership in moderating the effects of PI. Yet, we show that there are significant benefits (i.e., weaker effects of PI on probability to innovate) for firms that engage more in exporting.

REFERENCES

- Abubakar, Y. A., Hand, C., Smallbone, D., and Saridakis, G. (2019). What specific modes of internationalization influence SME innovation in Sub-Saharan least developed countries (LDCs)? *Technovation*, 79, 56-70.
- Adu-Danso, E., and Abbey, E. (2020). Does foreign ownership enhance technological innovation amongst manufacturing firms in Sub-Saharan Africa?. *Journal of Small Business & Entrepreneurship*, 1-27.
- Adner, R. and Levinthal, D., (2001). Demand heterogeneity and technology evolution: implications for product and process innovation. *Management science*, 47(5):611-628.
- Aghion, P., Bloom, N., Blundell, R., Griffith, R., and Howitt, P. (2005). Competition and Innovation: An Inverted-U Relationship. *The Quarterly Journal of Economics*, 120(2), 701-728.
- Aghion, P., Bergeaud, A., Lequien, M., and Melitz, M. J. (2018). *The impact of exports on innovation: Theory and evidence* (p. 678). Cambridge, MA: National Bureau of Economic Research.
- Aguinis, H., & Edwards, J. R. (2014). Methodological wishes for the next decade and how to make wishes come true. *Journal of Management Studies*, 51(1), 143-174.
- Aisen, A., and F.J. Veiga (2013). How does political instability affect economic growth?. *European Journal of Political Economy* 29: 151-167.
- Alam, A., Uddin, M., & Yazdifar, H. (2019). Institutional determinants of R&D investment: Evidence from emerging markets. *Technological Forecasting and Social Change*, 138, 34-44.
- Alesina, A., and Tabellini, G. (1989). External debt, capital flight and political risk. *Journal of international Economics*, 27(3-4), 199-220.
- Alesina, A. and Perotti, R. (1996). Income distribution, political instability, and investment. *European Economic Review*, 40(6), pp.1203-1228.
- Allard, G., Martinez, C. and Williams, C. (2012). Political instability, pro-business market reforms and their impacts on national systems of innovation. *Research Policy*, 41(3): 638-651.
- Anand, J., McDermott, G., Mudambi, R., and Narula, R. (2021). Innovation in and from emerging economies: New insights and lessons for international business research. *Journal of International Business Studies*, 52(4), 545-559.
- Ayyagari, M., Demirgüç-Kunt, A., and Maksimovic, V., (2012). Firm innovation in emerging markets: the role of finance, governance, and competition. *Journal of Financial and Quantitative Analysis*, 46(06): 1545-1580.
- Autio, E., H.J. Sapienza, and J.G. Almeida (2000). "Effects of Age at Entry, Knowledge Intensity, and Imitability on International Growth," *Academy of Management Journal* 43 (5): 909–1014.
- Balsmeier, B., and Czarnitzki, D. (2014). How important is industry-specific managerial experience for innovative firm performance? https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2387549
- Barasa, L., Knobon, J., Vermeulen, P., Kimuyu, P., and Kinyanjui, B. (2017). Institutions, resources and innovation in East Africa: A firm level approach. *Research Policy*, 46(1), 280-291.
- Bello, D. C., Radulovich, L. P., Javalgi, R. R. G., Scherer, R. F., and Taylor, J. (2016). Performance of professional service firms from emerging markets: Role of innovative services and firm capabilities. *Journal of World Business*, 51(3), 413-424.
- Ben Ali, M. S., and Krammer, S. (2016). The role of institutions in economic development. In *Economic Development in the Middle East and North Africa* (pp. 1-25). Palgrave Macmillan, New York.
- Bortoluzzi, G., Kadic-Maglajlic, S., Arslanagic-Kalajdzic, M., and Balboni, B. (2018). Innovativeness as a driver of the international expansion of developing markets' firms. *International Marketing Review*, 35(2), 215-235.
- Boso, N., Story, V. M., Cadogan, J. W., Micevski, M., and Kadić-Maglajlić, S. (2013). Firm innovativeness and export performance: Environmental, networking, and structural contingencies. *Journal of International Marketing*, 21(4), 62-87.
- Bigsten, A., and Söderbom, M. (2006). What have we learned from a decade of manufacturing enterprise surveys in Africa? *The World Bank Research Observer* 21(2):241-265.
- Boddeyn, J.J. and Brewer, T. (1994). International-business political behavior: New theoretical directions. *Academy of Management Review*, 19(1): 119–144.
- Boudreaux, C. J., Nikolaev, B. N., and Klein, P. (2019). Socio-cognitive traits and entrepreneurship: The moderating role of economic institutions. *Journal of Business Venturing*, 34(1), 178-196.

- Busse, M., and Hefeker, C. (2007). Political risk, institutions and foreign direct investment. *European Journal of Political Economy*, 23(2): 397–415.
- Cassiman, B., and Golovko, E., (2011). Innovation and internationalization through exports. *Journal of International Business Studies*, 42(1), 56-75.
- Chrisman, J. J., Chua, J. H., De Massis, A., Frattini, F., and Wright, M. (2015). The ability and willingness paradox in family firm innovation. *Journal of Product Innovation Management*, 32(3), 310-318.
- Cohen, W. M., and Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative science quarterly*, 128-152.
- Collier P. (2007). Economic causes of civil conflict and their implications for policy. In: C.A. Crocker, F.O. Hapson and P. All (Eds) *Leashing the dogs of war*. Washington DC. Institute of Peace.
- Cuervo-Cazurra, A., and Un, A.C. (2010). Why some firms never invest in formal R&D. *Strategic Management Journal*, 31(7), 759-779.
- Cumming, D., Rui, O., and Wu, Y. (2016). Political instability, access to private debt, and innovation investment in China. *Emerging Markets Review*, 29, 68-81.
- Cunha, M. P. E., Rego, A., Oliveira, P., Rosado, P., and Habib, N. (2014). Product innovation in resource-poor environments: Three research streams. *Journal of Product Innovation Management*, 31(2), 202-210.
- Darby, J., Li, C. and Muscatelli, V. (2004). Political uncertainty, public expenditure and growth. *European Journal of Political Economy*, 20(1), pp.153-179.
- Danneels, E (2002). The dynamics of product innovation and firm competencies. *Strategic Management Journal* 23 (121):1095-1121.
- Darendeli, I. S., and Hill, T. L. (2016). Uncovering the complex relationships between political risk and MNE firm legitimacy: Insights from Libya. *Journal of International Business Studies* 47(1):68-92.
- De Villa, M. A., Rajwani, T., Lawton, T. C., and Mellahi, K. (2018). To engage or not to engage with host governments: Corporate political activity and host country political risk. *Global Strategy Journal*.
- Delios, A., and Henisz, W. I. (2000). Japanese firms' investment strategies in emerging economies. *Academy of Management journal*, 43(3), 305-323.
- Doh, J. P., Lawton, T. C., and Rajwani, T. (2012). Advancing nonmarket strategy research: Institutional perspectives in a changing world. *Academy of Mmg Perspectives*, 26(3): 22-39.
- Edwards, J. R. (2001). Multidimensional constructs in organizational behavior research: An integrative analytical framework. *Organizational research methods*, 4(2), 144-192.
- Edwards, J. R. (2011). The fallacy of formative measurement. *Organizational Research Methods*, 14(2), 370-388.
- Ernst, H., Kahle, H. N., Dubiel, A., Prabhu, J., and Subramaniam, M. (2015). The antecedents and consequences of affordable value innovations for emerging markets. *Journal of Product Innovation Management*, 32(1), 65-79.
- Evanschitzky, H., M. Eisend, R. J. Calantone, and Y. Jiang. 2012. Success factors of product innovation: An updated meta-analysis. *Journal of Product Innovation Management* 29: 21-37.
- Finlay, K., Magnusson, L. M., and Schaffer, M. E. (2013). weakiv: Weak-instrument-robust tests and confidence intervals for instrumental-variable (IV) estimation of linear, probit and tobit models. URL: <http://ideas.repec.org/c/boc/bocode/s457684.html>.
- Fritsch, U. and Görg, H. (2015). Outsourcing, Importing and Innovation: Evidence from Firm-level Data for Emerging Economies. *Review of International Economics*, 23(4), pp.687-714.
- Furman, J. L., Porter, M. E., and Stern, S. (2002). The determinants of national innovative capacity. *Research policy*, 31(6), 899-933.
- Gao, G. Y., Murray, J. Y., Kotabe, M., and Lu, J. (2010). A “strategy tripod” perspective on export behaviors: Evidence from domestic and foreign firms based in an emerging economy. *Journal of International Business Studies*, 41(3), 377-396.
- Gaur, A.S. and Lu, J.W., 2007. Ownership strategies and survival of foreign subsidiaries: Impacts of institutional distance and experience. *Journal of management*, 33(1):84-110.
- Goldbach, S., and Nitsch, V. 2014. Extra Credit: Bank Finance and Firm Export Status in Germany. *The World Economy*, 37(7), 883-891.

- Goedhuys, M. 2007. "Learning, Product Innovation, and Firm Heterogeneity in Developing Countries; Evidence from Tanzania." *Industrial and Corporate Change* 16 (2): 269–292.
- Cassiman, B., and Golovko, E. (2011). Innovation and internationalization through exports. *Journal of International Business Studies*, 42(1), 56-75.
- Ganotakis, P., and Love, J. H. (2011). R&D, product innovation, and exporting: evidence from UK new technology based firms. *Oxford Economic Papers*, 63(2), 279-306.
- Globerman, S. and Shapiro, D. (2003). Governance infrastructure and US foreign direct investment. *Journal of International Business Studies*, 34(1), pp.19-39.
- Gorodnichenko, Y. and Schnitzer, M. (2013). Financial constraints and innovation: why poor countries don't catch up. *Journal of the European Economic Association*, 11(5), pp.1115-1152.
- Govindarajan, V. and Ramamurti, R., 2011. Reverse innovation, emerging markets, and global strategy. *Global Strategy Journal*, 1(3-4), pp.191-205.
- Guidolin, M., and La Ferrara, E. (2007). Diamonds Are Forever, Wars Are Not: Is Conflict Bad for Private Firms?. *American Economic Review*, 97(5), 1978-1993.
- Guan, J. C., Richard, C. M., Tang, E. P., and Lau, A. K. (2009). Innovation strategy and performance during economic transition: Evidences in Beijing, China. *Research Policy*, 38(5), 802-812.
- Guillén, M. F., and García-Canal, E. (2009). The American model of the multinational firm and the "new" multinationals from emerging economies. *Academy of Mgmt Perspectives*, 23(2), 23-35.
- Guo, S., and Fraser, M. W. (2014). *Propensity score analysis: Statistical methods and applications* (Vol. 11). SAGE publications.
- Ghura, M. D., and Mercereau, B. (2004). Political Instability and Growth: The Central African Republic (No. 4-80). International Monetary Fund.
- Gwenhamo, F., J.W. Fedderke, and R. De Kadt, 2012. "Measuring institutions Indicators of political rights, property rights and political instability in Zimbabwe." *Journal of Peace Research* 49(4): 593-603.
- Hashai, N., Kafouros, M., and Buckley, P. J. (2018). The performance implications of speed, regularity, and duration in alliance portfolio expansion. *Journal of Management*, 44(2), 707-731.
- Henisz, W.J., 2000. The institutional environment for economic growth. *Economics and Politics*, 12(1), pp.1-31.
- Hillman, A.J., Keim, G.D. and Schuler, D. (2004). Corporate political activity: a review and research agenda. *Journal of Management*, 30: 837–857.
- Hirsch, S., and Lev, B. (1971). Sales stabilization through export diversification. *The Review of Economics and Statistics*, 270-277.
- Hitt, M. A., Beamish, P. W., Jackson, S. E., and Mathieu, J. E. (2007). Building theoretical and empirical bridges across levels: Multilevel research in management. *Academy of Management journal*, 50(6), 1385-1399.
- Hodler R. (2006). The curse of natural resources in fractionalized countries. *European Economic Review* 50(6): 1367-1386.
- Hoskisson, R. E., Wright, M., Filatotchev, I. and Peng, M. W. (2013). 'Emerging multinationals from mid-range economies: The influence of institutions and factor markets'. *Journal of Management Studies*, 50: 1295–321.
- Jiménez, A. (2010). Does political risk affect the scope of the expansion abroad? Evidence from Spanish MNEs. *International Business Review*, 19(6), 619-633.
- Jong-A-Pin, R. (2009). On the measurement of political instability and its impact on economic growth. *European Journal of Political Economy*, 25(1), 15-29.
- Jouma C. (2005). *Going for Growth: Science, Technology and Innovation in Africa*. The Smith Institute, fAyyaLondon.
- Kafouros, M. I., Buckley, P. J., and Clegg, J. (2012). The effects of global knowledge reservoirs on the productivity of multinational enterprises: The role of international depth and breadth. *Research Policy*, 41(5), 848-861.
- Kafouros, M., and Aliyev, M. (2016). Institutional development and firm profitability in transition economies. *Journal of World Business*, 51(3), 369-378.

- Kafouros, M., Wang, C., Piperopoulos, P., and Zhang, M. (2015). Academic collaborations and firm innovation performance in China: The role of region-specific institutions. *Research Policy*, 44(3), 803-817.
- Kafouros, M., Wang, C., Mavroudi, E., Hong, J., and Katsikeas, C. S. (2018). Geographic dispersion and co-location in global R&D portfolios: Consequences for firm performance. *Research Policy*, 47(7), 1243-1255.
- Kahn, K. B., G. Barczak, J. Nicholas, A. Ledwith, and H. Perks. 2012. An examination of new product development best practice. *Journal of Product Innovation Management* 29 (2): 180–192.
- Kaufmann, D., Kraay, A. and Mastruzzi, M. (2008). Governance Matters VII: Aggregate and Individual Governance Indicators, 1996-2007. *SSRN Electronic Journal*.
- Kesternich, I., and Schnitzer, M. 2010. Who is afraid of political risk? Multinational firms and their choice of capital structure. *Journal of International Economics*, 82(2), 208-218.
- Kogut, B., and Zander, U. (1993). Knowledge of the firm and the evolutionary theory of the multinational corporation. *Journal of international business studies*, 24(4), 625-645.
- Kraay, A., Kaufmann, D., and Mastruzzi, M. (2010). *The worldwide governance indicators: methodology and analytical issues*. The World Bank.
- Krammer, S.M.S. (2009). “Drivers of National Innovation in Transition: Evidence from a Panel of Eastern European Countries.” *Research Policy* 38 (5): 845–860.
- Krammer, S.M.S. (2015). Do good institutions enhance the effect of technological spillovers on productivity? Comparative evidence from developed and transition economies. *Technological Forecasting and Social Change*, 94, 133-154.
- Krammer, S.M.S. (2016). The role of diversification profiles and dyadic characteristics in the formation of technological alliances: Differences between exploitation and exploration in a low-tech industry. *Research Policy*, 45(2), 517-532.
- Krammer, S. M. S. (2019). Greasing the wheels of change: bribery, institutions, and new product introductions in emerging markets. *Journal of Management*, 45 (5): 1889-1926.
- Krammer, S.M.S., Strange, R., and Lashitew, A. (2018). The export performance of emerging economy firms: The influence of firm capabilities and institutional environments. *International Business Review*, 27(1), 218-230.
- Krammer, S. M. (2018). A double-edged sword? The antipodal effects of institutional distance on partner selection in cross-border alliances. *Journal of World Business*, 53(6), 930-943.
- Krammer, S. M., and Jimenez, A. (2020). Do political connections matter for firm innovation? Evidence from emerging markets in Central Asia and Eastern Europe. *Technological Forecasting and Social Change*, 151, 119669.
- Krammer, S. M. (2021). Navigating the New Normal: Which firms have adapted better to the COVID-19 disruption?. *Technovation*, 102368.
- Kraemer-Mbula, E., Lorenz, E., Takala-Greenish, L., Jegede, O.O., Garba, T., Mutambala, M. and Esemu, T. (2019) ‘Are African micro- and small enterprises misunderstood? Unpacking the relationship between work organisation, capability development and innovation’, *Int. J. Technological Learning, Innovation and Development*, Vol. 11, No. 1, pp.1–30.
- Ksoll, C., Macchiavello, R. and Morjaria, A. (2015). *Do civil conflicts cost firms? Evidence from post-election Kenya* / *VOX, Policy Portal*. Voxeu.org. Available at: <http://www.voxeu.org/article/do-civil-conflicts-cost-firms-evidence-post-election-kenya> (Accessed 1 Oct. 2019)
- Lawton, T., McGuire, S., and Rajwani, T. (2013). Corporate political activity: A literature review and research agenda. *International Journal of Management Reviews*. 15(1): 86-105.
- Lazarini, S. G., Mesquita, L. F., Monteiro, F., and Musacchio, A. (2021). Leviathan as an inventor: An extended agency model of state-owned versus private firm invention in emerging and developed economies. *Journal of International Business Studies*, 52(4), 560-594.
- Lederman, D. (2010). An international multilevel analysis of product innovation. *Journal of International Business Studies*, 41(4), 606-619.
- Lerner, J. (2009). The empirical impact of intellectual property rights on innovation: Puzzles and clues. *American Economic Review*, 99(2), 343-48.
- Li, H., and K. Atuahene-Gima (2001). Product Innovation Strategy and the Performance of New Technology Ventures in China. *Academy of Management Journal* 44 (6), 1123–1134.

- Li, J., Xia, J., and Zajac, E. J. (2018). On the duality of political and economic stakeholder influence on firm innovation performance: Theory and evidence from Chinese firms. *Strategic Management Journal*, 39(1), 193-216.
- Liu, J., Chen, J., and Tao, Y. (2015). Innovation performance in new product development teams in China's technology ventures: the role of behavioral integration dimensions and collective efficacy. *Journal of Product Innovation Management*, 32(1), 29-44.
- Lorenz, E. (2014). Do credit constrained firms in Africa innovate less? A study based on nine African nations. A Study Based on Nine African Nations (October 29, 2014). Available at: <http://www.gredeg.cnrs.fr/Working-Papers/GREDEG-WP-2014-29.pdf> (Accessed May 2021)
- Love, J. H., and Mansury, M. A. (2009). Exporting and productivity in business services: Evidence from the United States. *International Business Review*, 18(6), 630-642.
- Mangena, M., Tauringana, V., and Chamisa, E., (2012). Corporate boards, ownership structure and firm performance in an environment of severe political and economic crisis. *British Journal of Management*, 23(S1), S23-S41.
- Mata, J., and Portugal, P. (2002). The survival of new domestic and foreign-owned firms. *Strategic management journal*, 23(4), 323-343.
- McCann, B. T., and Bahl, M. (2017). The influence of competition from informal firms on new product development. *Strategic Management Journal*, 38(7), 1518-1535.
- Melitz, M. J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica*, 71(6), 1695-1725.
- Nadkarni, S., and Chen, J. (2014). Bridging yesterday, today, and tomorrow: CEO temporal focus, environmental dynamism, and rate of new product introduction. *Academy of Management Journal*, 57(6), 1810-1833.
- North, D. C. (1990). Institutions, institutional change and economic performance. Cambridge university press.
- Oh, C. H., and Oetzel, J. (2017). Once bitten twice shy? Experience managing violent conflict risk and MNC subsidiary-level investment and expansion. *Strategic Management J*, 38(3), 714-731.
- Olaoye, I. J., Ayinde, O. E., Ajewole, O. O., and Adebisi, L. O. (2020). The role of research and development (R&D) expenditure and governance on economic growth in selected African countries. *African Journal of Science, Technology, Innovation and Development*, 1-8.
- Park, W. G. (2008). International patent protection: 1960–2005. *Research policy*, 37(4), 761-766.
- Piperopoulos, P., Kafourous, M., Aliyev, M., Liu, E. Y., and Au, A. (2021). How does informal entrepreneurship influence the performance of small formal firms? A cross-country institutional perspective. *Entrepreneurship & Regional Development*, 1-20.
- Peng, M. W., Wang, D. Y. L. and Jiang, Y. (2008). An institution-based view of international business strategy: A focus on emerging economies. *Journal of International Business Studies*, 39, 920–36.
- Podsakoff, N. P., MacKenzie S.b, Lee Y-J, and Podsakoff, N.P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 885(879), 10-1037.
- Podsakoff, N. P., Shen, W., and Podsakoff, P. M. (2006). The role of formative measurement models in strategic management research: review, critique, and implications for future research. *Research methodology in strategy and management*.
- Polachek, S. W., and Sevastianova, D. (2012). Does conflict disrupt growth? Evidence of the relationship between political instability and national economic performance. *The Journal of International Trade and Economic Development*, 21(3), 361-388.
- Prahalad, C. K. (2012). Bottom of the Pyramid as a Source of Breakthrough Innovations. *Journal of product innovation management*, 29(1), 6-12.
- Radas, S., and Božić, L. (2009). The antecedents of SME innovativeness in an emerging transition economy. *Technovation*, 29(6-7), 438-450.
- Rajwani, T., and Liedong, T. A. (2015). Political activity and firm performance within nonmarket research: A review and international comparative assessment. *Journal of World Business*, 50(2), 273-283.
- Ross M.L. (2004). What do we know about natural resources and civil war? *Journal of Peace Research* 41(3): 337-356.

- Rodrik, D. (1991). Policy uncertainty and private investment in developing countries. *Journal of Development Economics*, 36(2), pp.229-242.
- Roe, M. and Siegel, J. (2011). Political instability: Effects on financial development, roots in the severity of economic inequality. *Journal of Comparative Economics*, 39(3), pp.279-309.
- Story, V. M., Boso, N., and Cadogan, J. W. (2015). The form of relationship between firm-level product innovativeness and new product performance in developed and emerging markets. *Journal of Product Innovation Management*, 32(1), 45-64.
- Salomon, R. M., and Shaver, J. M., 2005. Learning by exporting: new insights from examining firm innovation. *Journal of Economics and Management Strategy*, 14(2), 431-460.
- Schneider, L., Gánther, J. and Brandenburg, B. (2010). Innovation and skills from a sectoral perspective: a linked employer - employee analysis. *Economics of Innovation and New Technology*, 19(2), pp.185-202.
- Shankar, V., and Narang, U. (2019). Emerging market innovations: unique and differential drivers, practitioner implications, and research agenda. *J of the Academy of Marketing Science*, 1-23.
- Singh, J. (2007). Asymmetry of knowledge spillovers between MNCs and host country firms. *Journal of international business studies*, 38(5), 764-786
- Smith, K. G., Collins, C. J., and Clark, K. D. (2005). Existing knowledge, knowledge creation capability, and the rate of new product introduction in high-technology firms. *Academy of Management Journal*, 48(2), 346-357.
- Steinfeld, L., and Holt, D. (2019). Toward A Theory on the Reproduction of Social Innovations in Subsistence Marketplaces. *Journal of Product Innovation Management*, 36(6), 764-799.
- Story, V. M., Boso, N., and Cadogan, J. W. (2015). The form of relationship between firm-level product innovativeness and new product performance in developed and emerging markets. *Journal of Product Innovation Management*, 32(1), 45-64.
- Straus, S. (2012). Wars do end! Changing patterns of political violence in sub-Saharan Africa. *African Affairs*, 12-15.
- Subramaniam, M., Ernst, H., and Dubiel, A. (2015). From the Special Issue Editors: Innovations for and from Emerging Markets. *Journal of Product Innovation Management*, 32 (1), 5-11.
- Sun, P., Mellahi, K., and Wright, M. (2012). The contingent value of corporate political ties. *The Academy of Management Perspectives*, 26(3), 68-82.
- Van Uden, A., Knoben, J., and Vermeulen, P. (2017). Human capital and innovation in Sub-Saharan countries: A firm-level study. *Innovation*, 19(2), 103-124.
- Von Zedtwitz, M., Corsi, S., Sjøberg, P. V., and Frega, R. (2015). A typology of reverse innovation. *Journal of Product Innovation Management*, 32(1), 12-28.
- Wang, Y., and Li-Ying, J. (2015). Licensing foreign technology and the moderating role of local R&D collaboration: Extending the relational view. *Journal of Product Innovation Management*, 32(6), 997-1013.
- Wang, T., and Libaers, D. (2016). Nonmimetic knowledge and innovation performance: Empirical evidence from developing countries. *Journal of Product Innovation Management*, 33: 570-588.
- Wang, C., Kafourous, M., Yi, J., Hong, J., and Ganotakis, P. (2020). The role of government affiliation in explaining firm innovativeness and profitability in emerging countries: Evidence from China. *Journal of World Business*, 55(3), 101047.
- Waguespack, D., Birnir, J. and Schroeder, J. (2005). Technological development and political stability: Patenting in Latin America and the Caribbean. *Research Policy*, 34(10), pp.1570-1590.
- Weinstein, J. M. and Imai K. (2000). *Measuring the economic impact of civil war*. Center for International Development, Harvard University.
- Witt, M. A., and Lewin, A. Y. (2007). Outward foreign direct investment as escape response to home country institutional constraints. *Journal of International business studies*, 579-594.
- Yang, C. H. (2018). Exports and innovation: the role of heterogeneity in exports. *Empirical Economics*, 55(3), 1065-1087.
- Yu, F., Guo, Y., Lettic, F., and Barnes, S. J. (2019). Regional anti-corruption effort, political connections and firm innovation effort: evidence from China. *Bulletin of Economic Research*, 71(1), 18-32.
- Zeschky, M., Widenmayer, B., & Gassmann, O. (2011). Frugal innovation in emerging markets. *Research-Technology Management*, 54(4), 38-45.

- Zhao, M. (2006). Conducting R&D in countries with weak intellectual property rights protection. *Management Science*, 52(8), 1185-1199.
- Zhou, K. Z. (2006). Innovation, imitation, and new product performance: The case of China. *Industrial Marketing Management*, 35(3), 394-402.
- Zhou, K. Z., Gao G.Y., and Hongxin Z. (2017). State ownership and firm innovation in China: An integrated view of institutional and efficiency logics. *Administrative Science Quarterly* 62, no. 2 (2017): 375-404.
- Zhu, H. and Chung, C.N. (2014). Portfolios of political ties and business group strategy in emerging economies: Evidence from Taiwan. *Administrative Science Quarterly*, 59, 599–638.

Table 1. Variables employed: labels, sources, and description

Variable	Source	Details
Prod innov	ES	Product/service innovation from the question: “During the last three years, did your establishment: introduce into the market any new or significantly improved products (goods or services)?”
PI	WGI	The level of political instability as well as violence and terrorism in a country (0-5)- own computations
Exports	ES	Total exports from two questions: “In 2005, what percentage of your establishment’s sales were: direct exports?” and “In 2005, what percentage of your establishment’s sales were: indirect exports?”
ExpDum	ES	Dummy which equals 1 if export exports >1%, and 0 otherwise
Foreign own	ES	Foreign ownership from survey question: “What percentage of your firm is owned by: private foreign individuals, companies or organizations?”
ForeignDum	ES	Dummy which equals 1 if foreign ownership >50%, and 0 otherwise.
Firm size	ES	The logarithm of the total number of employees in the previous year
Labor prod	ES	The logarithm of total firm sales divided by total labor costs
Rel skill	ES	Reliance on skilled human capital from the question: “Do you think that the following presents any obstacle to the current operations of your establishment: inadequately educated workforce?”
No. comp	ES	Number of competitors from the question “How many competitors did you face at the end of 2005 (2006)?”
Firm age	ES	Logarithm of firm age where age = current year - year of establishment
For comp	ES	Foreign competition from the question “How important is the influence of foreign competitors on your production costs”
Mgm exp	ES	Managerial experience from the question: “How many years has the top manager worked: in a managerial function in this sector”
Gov own	ES	Governmental ownership from the question “What percentage of your firm is owned by state/government?”
No. comp	ES	Number of competitors from the question “How many competitors did you face at the end of 2005(2006)?”
Patent stock	USPTO	Logarithm of the number of U.S. patent applications per country between 1946 and 2004 divided by its total population
FDI stock	WDI	Logarithm of foreign direct investment stock, net inflows (in current USD)
GDP pc	WDI	Logarithm of GDP per capita
IPR	Park (2008)	Composite index of Intellectual Property Protection covering five aspects of IP: extent of coverage, membership in international agreements, provisions for loss of protection, enforcement options, and duration.
Polcon	Henisz (2002)	Political constraints index measuring the feasibility of a change in policy given the structure of political institutions (the number of veto points) and the preferences of the actors involved (the partisan alignment of various veto points and the heterogeneity or homogeneity of the preferences within each branch).
Human capital	Barro and Lee (2010); UNDP	Average years of schooling for population aged 25 and over (for both males and females)
PI (obstacle)	ES	Whether the firm perceives PI in the country to be the most or second most severe obstacle for its operations (dummy)
BRD	WDI	Battle related deaths in conflicts (per 1,000 population)
Gov. change	Center for Systemic Peace	Number of adverse regime changes times the magnitude of polity change.

Table 2. Descriptive statistics

Variables	Mean	Std. Dev.	Min	Max
Prod innov	0.50	0.50	0.00	1.00
PI	3.65	0.74	1.58	5.00
Exports	5.49	17.73	0.00	100.00
ExpDum	0.15	0.36	0.00	1.00
Foreign own	0.14	0.30	0.00	100.00
ForeignDum	0.11	0.31	0.00	1.00
Firm size*	3.02	1.09	1.10	8.29
Labor prod*	1.74	0.86	-0.29	9.02
Rel skill	2.00	1.17	1.00	5.00
No. comp	3.48	0.83	1.00	4.00
Firm age*	2.38	0.76	0.00	7.65
For comp	2.10	1.17	1.00	4.00
Mgm exp	1.18	8.57	0.00	75.00
Gov. own	0.75	8.04	0.00	100.00
No. comp	3.48	0.84	1.00	4.00
Patent stock*	0.01	0.01	0.00	0.06
FDI stock*	17.34	1.93	14.51	20.99
GDP pc*	5.93	0.72	4.92	8.10
IPR	2.87	0.54	1.20	3.52
Polcon	0.24	0.17	0.00	0.43
Human capital	4.60	1.33	1.60	8.28
PI (obstacle)	0.08	0.26	0.00	1.00
BRD	0.52	0.60	0.00	2.43
Gov. change	18.31	12.31	0.00	40.00

Note: * denotes variables which have been logarithmically transformed to reduce skewness and improve scalability of these variables

Table 3. Pairwise correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Prod innov	1																		
PI	-0.1131*	1																	
Exports	0.0652*	-0.1747*	1																
ExportDum	0.1201*	-0.1834*	0.7290*	1															
Foreignown	0.0239	-0.1149*	0.2163*	0.2229*	1														
ForeignDum	0.0291	-0.1083*	0.2050*	0.2111*	0.9635*	1													
lnlabprod	0.1284*	-0.1309*	0.1458*	0.2095*	0.1654*	0.1691*	1												
lnsize	0.2458*	-0.1597*	0.4240*	0.4445*	0.2773*	0.2707*	0.2435*	1											
lnage	0.0587*	-0.0525*	0.1270*	0.2202*	0.0733*	0.0756*	0.0958*	0.3073*	1										
For comp	0.0777*	-0.0874*	0.1659*	0.1801*	0.1377*	0.1237*	0.0586*	0.1738*	0.0668*	1									
Rel skill	0.0904*	-0.1657*	0.0913*	0.1098*	0.0985*	0.0901*	0.0710*	0.1094*	-0.0233	0.1543*	1								
Mgm exp	0.0222	-0.0511*	0.0998*	0.1554*	0.0699*	0.0634*	0.0630*	0.1962*	0.5251*	0.0367*	0.0121	1							
Gov. own	0.0199	-0.0358*	0.0950*	0.0622*	-0.0225	-0.0173	-0.007	0.1338*	0.1025*	0.0236	0.028	0.0244	1						
No. comp	0.0452*	0.0878*	-0.0756*	-0.0735*	-0.1035*	-0.0965*	0.0296	-0.0645*	-0.0127	0.0321	-0.0023	-0.0144	-0.0472*	1					
ipr	0.0569*	-0.2757*	0.0516*	0.0832*	0.0016	0.0075	0.1479*	0.0790*	0.1208*	-0.1597*	-0.0935*	0.1036*	-0.0259	0.1790*	1				
polconiii	0.1036*	0.0613*	-0.0755*	-0.0634*	-0.1965*	-0.1888*	-0.0840*	-0.0024	0.0081	-0.0478*	-0.1385*	0.0084	-0.0189	0.1178*	0.0956*	1			
hk	0.1560*	-0.4459*	0.0641*	0.1007*	0.0333	0.0243	0.0812*	0.1714*	0.1134*	0.0766*	-0.0146	0.0491*	-0.0093	0.1261*	0.4451*	0.4988*	1		
lnfdi	0.0357*	-0.3470*	0.1260*	0.1346*	0.1386*	0.1194*	0.0736*	0.1514*	0.0439*	0.2486*	0.1988*	0.0103	0.0346	-0.1532*	-0.4610*	-0.2529*	0.1205*	1	
lnpatpop	0.1144*	-0.2480*	0.1510*	0.2524*	-0.0284	-0.0297	0.1302*	0.2224*	0.2041*	0.0672*	-0.0034	0.1326*	0.0159	0.0463*	0.1397*	0.3867*	0.3326*	0.1097*	1
lngdp	0.0904*	-0.6491*	0.1490*	0.1841*	0.1569*	0.1404*	0.0888*	0.1707*	0.0373*	0.1938*	0.1457*	0.0292	0.0366*	-0.1151*	-0.0251	0.0932*	0.5103*	0.4793*	0.3889*

Notes: * Denotes statistical significance at 5% or better; N=3,014 observations for all variables; Two-tailed tests performed.

Table 4. Main results: Multilevel (mixed) probit regressions

Variables/DVs	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	<i>all</i>	<i>all</i>	<i>all</i>	<i>all</i>	<i>all</i>	<i>foreign</i>	<i>domestic</i>
<i>Level 1 (firm-level)</i>							
Insize	0.259*** [0.030]	0.259*** [0.030]	0.258*** [0.030]	0.280*** [0.030]	0.283*** [0.031]	0.261*** [0.072]	0.307*** [0.035]
Inage	0.012 [0.040]	0.014 [0.040]	0.014 [0.040]	0.005 [0.040]	0.001 [0.040]	-0.143 [0.100]	0.015 [0.044]
For comp	0.041+ [0.023]	0.042+ [0.023]	0.044+ [0.023]	0.047** [0.023]	0.045** [0.023]	-0.036 [0.067]	0.054** [0.025]
Rel skill	0.091*** [0.022]	0.090*** [0.022]	0.090*** [0.022]	0.090*** [0.022]	0.089*** [0.022]	0.090 [0.060]	0.092*** [0.024]
Mgm exp	-0.005 [0.003]	-0.005 [0.003]	-0.005 [0.003]	-0.005 [0.003]	-0.005 [0.003]	-0.013 [0.008]	-0.003 [0.004]
Gov own	-0.002 [0.003]	-0.002 [0.003]	-0.002 [0.003]	-0.002 [0.003]	-0.002 [0.003]	0.002 [0.004]	0.000 [0.017]
No comp	0.050 [0.031]	0.051+ [0.031]	0.051 [0.031]	0.049 [0.031]	0.048 [0.031]	0.152+ [0.083]	0.037 [0.034]
ExpDum	0.051 [0.081]	0.047 [0.080]	0.054 [0.081]	0.222** [0.110]	0.203+ [0.110]	0.346 [0.236]	0.134 [0.127]
<i>Level 2 (country-level)</i>							
ipr	0.057 [0.188]	-0.063 [0.194]	-0.073 [0.194]	-0.046 [0.191]	-0.073 [0.192]	0.406 [0.304]	-0.147 [0.199]
polconiii	0.122 [0.555]	0.299 [0.546]	0.307 [0.545]	0.346 [0.535]	0.337 [0.538]	0.082 [1.010]	0.334 [0.554]
hk	0.093 [0.079]	0.094 [0.077]	0.098 [0.077]	0.087 [0.075]	0.095 [0.076]	-0.079 [0.117]	0.12 [0.078]
lnfdi	-0.037 [0.050]	-0.059 [0.050]	-0.062 [0.050]	-0.05 [0.049]	-0.056 [0.050]	0.067 [0.076]	-0.079 [0.051]
lnpatpop	0.119 [0.123]	0.091 [0.120]	0.08 [0.119]	0.068 [0.117]	0.069 [0.118]	0.171 [0.168]	0.055 [0.124]
lngdp	-0.01 [0.113]	-0.115 [0.124]	-0.11 [0.124]	-0.122 [0.122]	-0.127 [0.122]	-0.132 [0.179]	-0.115 [0.129]
<i>Hypotheses</i>							
H1: PI		-0.217** [0.106]	-0.223** [0.112]	-0.253** [0.110]	-0.262** [0.112]	-0.260+ [0.152]	-0.277** [0.118]
ForeignDum			-0.378 [0.294]		-0.014 [0.326]		
H2: ForeignDum * PI			0.101 [0.082]		0.028 [0.089]		
Exports				-0.023*** [0.006]	-0.017** [0.008]	-0.023** [0.010]	-0.018** [0.009]

H3a: Exports * PI				0.005***	0.004**	0.004	0.005+
				[0.002]	[0.002]	[0.003]	[0.003]
ForeignDum *							
Exports					0.000		
					[0.004]		
H3b: ForeignDum *							
Exports * PI					-0.009		
					[0.012]		
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,014	3,014	3,014	3,014	3,014	354	2,660
Log Likelihood	-1884.33	-1882.77	-1881.94	-1873.72	-1870.59	-206.72	-1649.80
LR Chi Square	196.19	200.00	201.49	217.07	222.35	49.77	202.02
AIC	3820.67	3819.53	3821.88	3805.44	3807.19	469.44	3357.60
BIC	3976.90	3981.77	3996.14	3979.70	4005.48	577.46	3528.27

Notes:

Level 1 n=3,014; level 2 n=15.

The measure of political instability used in these estimations comes from the World Bank Governance Indicators.

All models include a constant term (not reported).

*** p<0.01, ** p<0.05, +p<0.10.

Table 5. Robustness checks: Probit regressions

Variables/DVs	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
	<i>all</i>	<i>all</i>	<i>all</i>	<i>all</i>	<i>all</i>	<i>foreign</i>	<i>domestic</i>
Insize	0.283*** [0.026]	0.281*** [0.026]	0.289*** [0.027]	0.299*** [0.028]	0.316*** [0.032]	0.263*** [0.068]	0.336*** [0.033]
Inage	-0.018 [0.038]	-0.013 [0.038]	-0.013 [0.038]	-0.025 [0.038]	-0.02 [0.041]	-0.133 [0.097]	-0.016 [0.043]
For comp	0.024 [0.022]	0.028 [0.022]	0.03 [0.022]	0.03 [0.022]	0.032 [0.022]	-0.048 [0.065]	0.044+ [0.024]
Rel skill	0.088*** [0.021]	0.081*** [0.021]	0.081*** [0.021]	0.081*** [0.021]	0.084*** [0.022]	0.076 [0.058]	0.086*** [0.023]
Mgm exp	-0.004 [0.003]	-0.004 [0.003]	-0.004 [0.003]	-0.004 [0.003]	-0.005 [0.003]	-0.01 [0.008]	-0.004 [0.004]
Gov own	-0.001 [0.003]	-0.002 [0.003]	-0.002 [0.003]	-0.001 [0.003]	-0.002 [0.003]	0.002 [0.004]	-0.002 [0.015]
No comp	0.056+ [0.030]	0.065** [0.030]	0.062** [0.030]	0.062** [0.030]	0.054+ [0.031]	0.198** [0.079]	0.04 [0.033]
ipr	-0.003 [0.073]	-0.108 [0.079]	-0.113 [0.079]	-0.121 [0.080]	-0.124 [0.080]	0.322 [0.241]	-0.174** [0.088]
polconiii	0.449** [0.217]	0.497** [0.218]	0.468** [0.221]	0.527** [0.219]	0.467** [0.230]	-0.152 [0.854]	0.492** [0.237]
hk	0.084** [0.034]	0.085** [0.034]	0.088*** [0.034]	0.083** [0.034]	0.084** [0.034]	-0.073 [0.100]	0.102*** [0.037]
lnfdi	-0.002 [0.020]	-0.021 [0.021]	-0.024 [0.021]	-0.023 [0.021]	-0.024 [0.021]	0.052 [0.061]	-0.039+ [0.023]
lnpatpop	0.062 [0.049]	0.064 [0.049]	0.054 [0.050]	0.035 [0.050]	0.055 [0.061]	0.197 [0.136]	-0.001 [0.057]
lngdp	-0.022 [0.048]	-0.113** [0.055]	-0.103+ [0.055]	-0.116** [0.055]	-0.123** [0.056]	-0.103 [0.152]	-0.097 [0.062]
H1: PI		-0.169*** [0.049]	-0.183*** [0.053]	-0.217*** [0.051]	-0.217*** [0.054]	-0.284** [0.123]	-0.217*** [0.058]
ForeignDum			-0.345 [0.283]		-0.024 [0.316]		
H2: ForeignDum * PI			0.068 [0.078]		0.002 [0.086]		
Exports				-0.023*** [0.005]	-0.020*** [0.008]	-0.018** [0.008]	-0.021*** [0.008]
ExpDum				0.246** [0.107]	0.234** [0.108]	0.384+ [0.228]	0.164 [0.125]
H3a: Exports * PI				0.005***	0.005**	0.002	0.006**

ForeignDum *				[0.002]	[0.002]	[0.003]	[0.002]
Exports					0.000		
					[0.011]		
H3b: ForeignDum							
* Exports * PI					-0.002		
					[0.004]		
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,014	3,014	3,014	3,014	3,014	354	2,660
VIF	1.69	1.78	2.81	2.97	8.27	2.82	3.38
Log Likelihood	1945.163	-1939.174	-1937.887	-1927.822	-1638.399	-212.025	-1692.468
LR Chi Square	287.32	299.30	301.87	322.01	295.32	63.80	302.55
AIC	3936.33	3926.35	3927.78	3909.64	3406.80	476.05	3438.94
BIC	4074.58	4070.61	4084.06	4071.94	3797.38	576.65	3597.86

Notes:

The measure of political instability used in these estimations comes from the World Bank Governance Indicators; All models include a constant term (not reported). Robust standard errors clustered at the country-level are reported in parentheses. *** p<0.01, ** p<0.05, +p<0.10.

Table 6. Robustness checks: IV Probit regressions

Variables/DVs	Model 15	Model 16	Model 17
	<i>all</i>	<i>foreign</i>	<i>domestic</i>
Lnsiz	0.184*** [0.054]	0.281*** [0.068]	0.065 [0.073]
Lnage	-0.119*** [0.034]	-0.101 [0.101]	-0.132*** [0.034]
For comp	0.021 [0.019]	-0.066 [0.067]	0.050** [0.020]
Rel skill	0.043+ [0.023]	0.094 [0.059]	0.024 [0.024]
Mgm exp	-0.005+ [0.003]	-0.012 [0.008]	0.000 [0.003]
Gov own	0.001 [0.003]	0.001 [0.003]	-0.01 [0.011]
No comp	0.012 [0.027]	0.018 [0.136]	0.052** [0.027]
Ipr	-0.189*** [0.067]	0.081 [0.294]	-0.102 [0.074]
polconiii	0.623*** [0.190]	-0.75 [0.827]	0.642*** [0.198]
Hk	0.027 [0.032]	-0.036 [0.100]	-0.011 [0.036]

Lnfdi	-0.026 [0.017]	0.053 [0.058]	-0.008 [0.019]
Inpatpop	-0.236*** [0.056]	0.223 [0.146]	-0.357*** [0.049]
Lngdp	-0.113** [0.048]	-0.057 [0.149]	-0.076 [0.051]
PI	-0.474*** [0.048]	-0.495*** [0.142]	-0.401*** [0.058]
Exports	-0.189*** [0.016]	-0.094** [0.043]	-0.239*** [0.015]
ExpDum	2.304*** [0.355]	0.475 [0.690]	3.168*** [0.298]
Exports * PI	0.046*** [0.005]	0.024** [0.012]	0.056*** [0.005]
Industry FE	Yes	Yes	Yes
N	3,014	354	2,660
VIF	2,97	2.82	3.38
Wald exogeneity	39.82***	1.90	185.64***
Log Likelihood	-10170.74	-1483.79	-8082.98
LR Chi Square	1655.57	100.20	3880.73
AIC	20513.48	3133.58	16337.96
BIC	21030.25	3453.79	16844.09

Notes:

Firm export propensity is instrumented with firm's productivity and average export propensity at the level of an industry and city unit. All models include a constant term (not reported). *** p<0.01, ** p<0.05, *p<0.10.

Table 7. Robustness checks: Heckman selection models

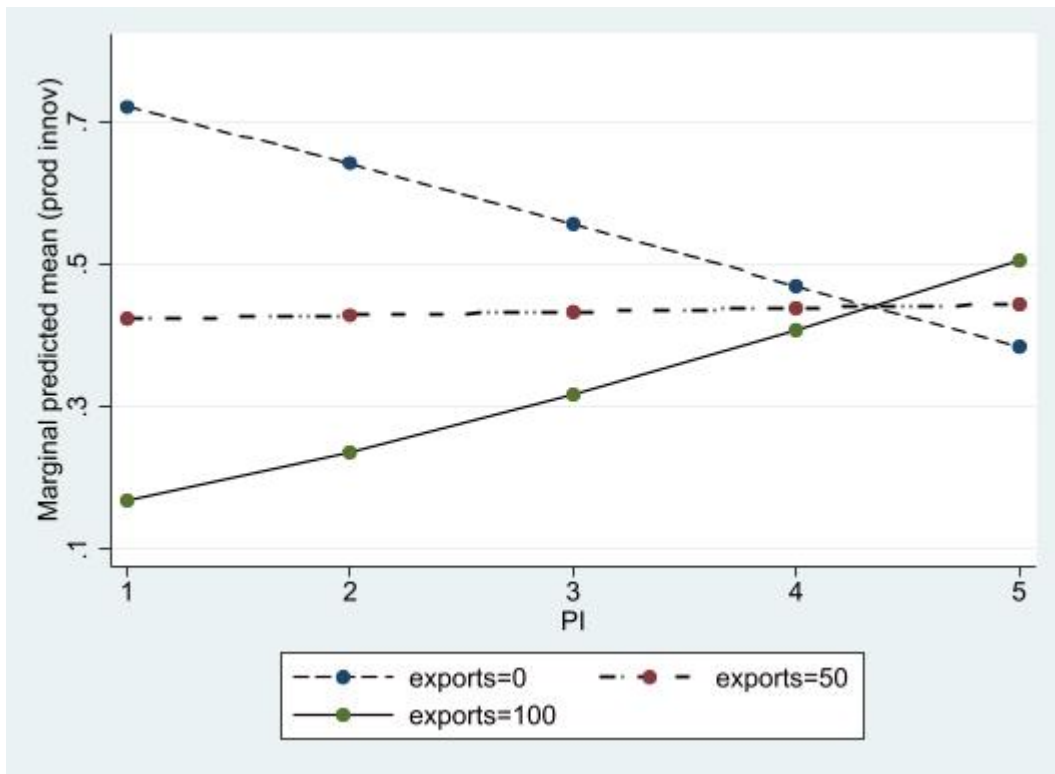
Variables/DVs	Model 18	Model 19	Model 20
	<i>all</i>	<i>foreign</i>	<i>domestic</i>
Insize	0.299*** [0.036]	0.255*** [0.088]	0.338*** [0.041]
Inage	-0.022 [0.040]	-0.105 [0.098]	-0.017 [0.044]
For comp	0.033 [0.022]	-0.03 [0.065]	0.044+ [0.024]
Rel skill	0.084*** [0.021]	0.096+ [0.058]	0.086*** [0.023]
Mgm exp	-0.004 [0.003]	-0.011 [0.008]	-0.004 [0.004]
Gov own	-0.002	0.002	-0.002

	[0.003]	[0.004]	[0.015]
No comp	0.056+	0.157+	0.039
	[0.030]	[0.080]	[0.033]
ipr	-0.12	0.31	-0.173+
	[0.080]	[0.243]	[0.088]
polconiii	0.523**	-0.339	0.494**
	[0.227]	[0.858]	[0.247]
hk	0.082**	-0.074	0.101***
	[0.034]	[0.100]	[0.037]
lnfdi	-0.023	0.062	-0.038+
	[0.021]	[0.062]	[0.023]
lnpatpop	0.046	0.260+	0.002
	[0.054]	[0.144]	[0.062]
lngdp	-0.122**	-0.110	-0.100
	[0.055]	[0.152]	[0.062]
PI	-0.222***	-0.304**	-0.217***
	[0.051]	[0.128]	[0.058]
Exports	-0.025***	-0.023**	-0.021**
	[0.006]	[0.009]	[0.008]
Exports * PI	0.007***	0.005+	0.006**
	[0.002]	[0.003]	[0.002]
IMR	-0.026	-0.008	-0.016
	[0.073]	[0.185]	[0.081]
Industry FE	Yes	Yes	Yes
N	3,014	354	2,660
Log Likelihood	-1926.711	-210.038	-1692.308
LR Chi Square	316.02	62.553	300.116
AIC	3907.421	472.075	3438.616
BIC	4069.665	572.381	3597.52

Notes:

IMR is the Inverse Mills ration computed in the first-stage regressions where the self-selection into exporting is modelled as a function of firm productivity, size, age, and the average export propensity of other firms in the same city and industry unit. The measure of political instability used in these estimations comes from the World Bank Governance Indicators; All models include a constant term (not reported). Robust standard errors clustered on the country are reported in parentheses. *** p<0.01, ** p<0.05, +p<10.

Figure 1. The moderating effect of exports on the relationship between political instability (PI) and firm product innovation.



Note: These values are based on the estimates from Model 4 (Table 4).

APPENDIX A.

Table A1. Descriptive statistics for the main variables of interest. Breakdown by country

Country	Prod Innov			Foreign own		ForeignDum	
	Obs.	Mean	SD	Mean	SD	Mean	SD
Angola	209	0.48	0.50	5.84	20.34	0.04	0.20
Botswana	114	0.58	0.50	39.31	44.80	0.38	0.49
Burundi	102	0.20	0.40	21.35	40.27	0.22	0.41
DR Congo	149	0.20	0.40	27.89	43.43	0.27	0.44
Gambia	33	0.64	0.49	9.70	29.21	0.09	0.29
Guinea	132	0.38	0.49	10.08	29.44	0.11	0.31
Guinea Bissau	49	0.20	0.41	6.33	22.77	0.06	0.24
Kenya	396	0.66	0.48	13.52	32.44	0.13	0.34
Mauritania	79	0.46	0.50	7.78	21.46	0.08	0.27
Namibia	104	0.50	0.50	20.92	37.18	0.20	0.40
Nigeria	945	0.53	0.50	0.75	7.94	0.01	0.09
Rwanda	58	0.53	0.50	16.03	35.39	0.16	0.37
Swaziland	70	0.56	0.50	35.84	46.88	0.37	0.49
Tanzania	271	0.56	0.50	11.29	29.43	0.10	0.30
Uganda	303	0.52	0.50	15.25	34.16	0.15	0.35

Country	Exports		ExpDum		PI (WGI)	PI (obstacle)	
	Mean	SD	Mean	SD	Mean	Mean	SD
Angola	0.26	3.47	0.01	0.10	4.20	0.02	0.15
Botswana	9.53	24.66	0.23	0.42	1.58	0.00	0.00
Burundi	1.52	10.47	0.05	0.22	4.84	0.30	0.46
DR Congo	3.07	11.39	0.08	0.27	5.00	0.34	0.48
Gambia	3.03	8.74	0.18	0.39	2.04	0.09	0.29
Guinea	4.92	14.11	0.20	0.40	3.74	0.06	0.24
Guinea Bissau	3.49	15.33	0.08	0.28	3.50	0.35	0.48
Kenya	13.69	23.33	0.42	0.49	3.57	0.03	0.16
Mauritania	11.35	27.96	0.24	0.43	2.34	0.03	0.16
Namibia	13.80	31.04	0.32	0.47	2.18	0.06	0.23
Nigeria	0.92	5.68	0.03	0.18	3.91	0.07	0.25
Rwanda	7.07	22.54	0.19	0.40	4.17	0.07	0.26
Swaziland	27.76	40.25	0.39	0.49	2.57	0.04	0.20
Tanzania	3.73	13.10	0.15	0.36	3.14	0.05	0.21
Uganda	6.30	19.20	0.17	0.37	3.93	0.05	0.22

Table A2. Descriptive statistics for the main variables of interest. Breakdown by industry

Variables Industry / statistic	Obs.	Prod Innov		ForeignDum		Foreign own	
		Mean	SD	Mean	SD	Mean	SD
Food	848	0.54	0.50	0.10	0.30	10.79	29.06
Garments	509	0.48	0.50	0.06	0.24	6.80	24.35
Textiles	67	0.57	0.50	0.24	0.43	25.75	42.71
Machinery & Equipment	39	0.54	0.51	0.23	0.43	26.03	42.33
Chemicals	133	0.68	0.47	0.15	0.36	15.45	33.50
Electronics	10	0.60	0.52	0.00	0.00	0.00	0.00
Non-metallic minerals	70	0.41	0.50	0.27	0.45	25.94	41.09
Wood, wood products & furniture	526	0.45	0.50	0.06	0.24	6.55	23.50
Metal & Metal products	320	0.45	0.50	0.09	0.29	9.04	26.95
Other Manufacturing	492	0.53	0.50	0.17	0.38	17.19	35.79

Variables Industry / statistic	ExportDum		Exports		PI (obstacle)	
	Mean	SD	Mean	SD	Mean	SD
Food	0.14	0.34	6.27	20.3	0.07	0.26
Garments	0.14	0.34	6.27	20.55	0.09	0.29
Textiles	0.42	0.5	17.34	29.55	0.04	0.21
Machinery & Equipment	0.38	0.49	13.92	25.32	0.03	0.16
Chemicals	0.29	0.45	6.5	12.1	0.09	0.29
Electronics	0.3	0.48	10	17	0.00	0.00
Non-metallic minerals	0.23	0.42	7.2	18.5	0.07	0.26
Wood, wood products & furniture	0.07	0.26	1.8	9.22	0.07	0.26
Metal & Metal products	0.12	0.33	3.41	12.91	0.06	0.24
Other Manufacturing	0.2	0.4	5.8	16.69	0.09	0.28

Table A3. Marginal effects at the means (MEMs)

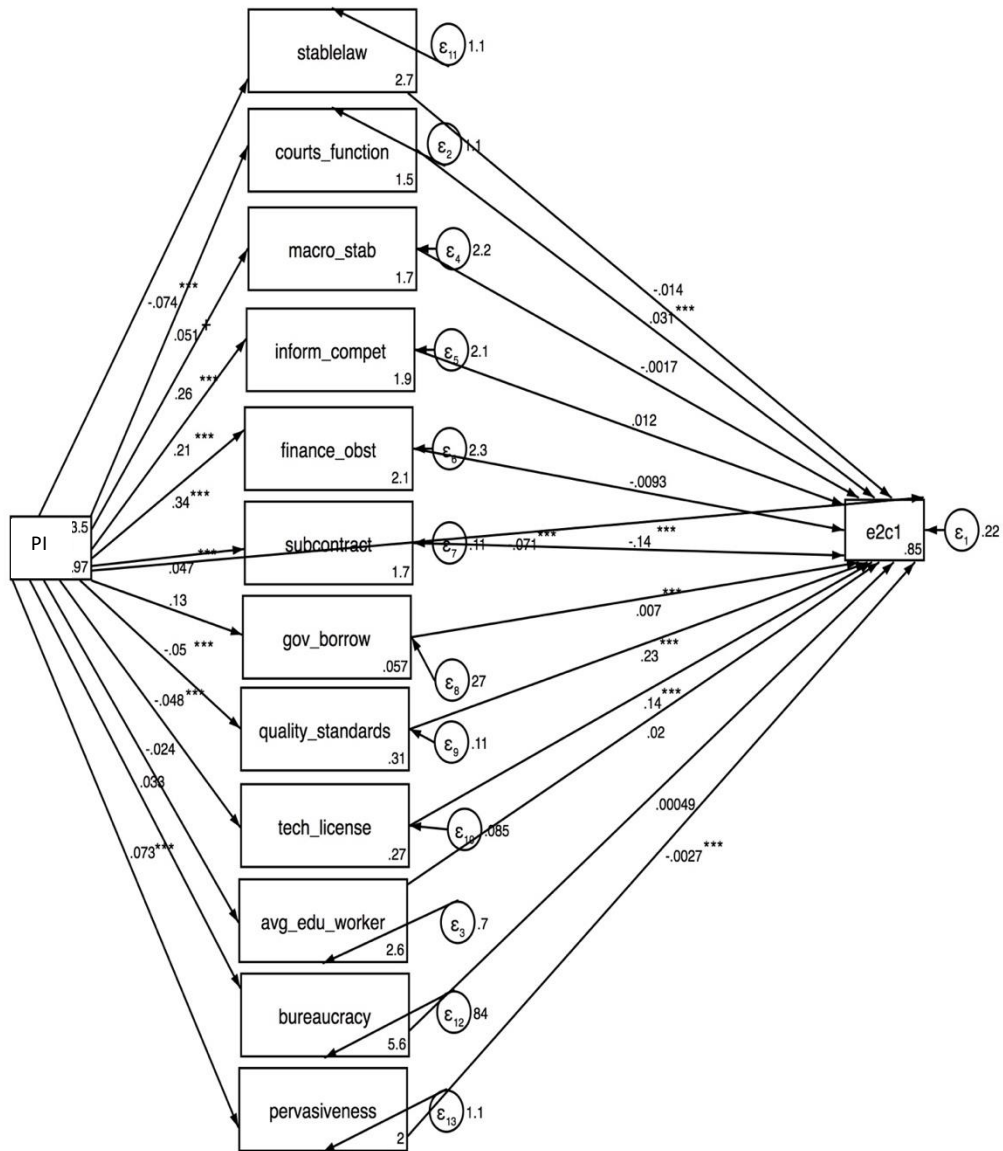
Variables/DVs	dy/dx	St. err.
lnsize	0.119***	[0.012]
lnage	-0.010	[0.015]
For comp	0.012	[0.009]
Rel skill	0.033***	[0.008]
Mgm exp	-0.002	[0.001]
Gov own	-0.000	[0.001]
No comp	0.018	[0.014]
ipr	-0.051	[0.031]
polconiii	0.203**	[0.086]
hk	0.024	[0.014]
lnfdi	-0.009	[0.008]
lnpatpop	0.015	[0.019]
lngdp	-0.037	[0.046]
PI	-0.093***	[0.021]
Exports	-0.019**	[0.008]
Foreign own	-0.000	[0.000]

Notes: The MEMs are obtained following the specification of the full model probit estimation (Model 12 in Table 5).
 *** p<0.01, ** p<0.05, *p<0.10.

Table A4. Additional variables to test mechanisms through which PI affects firm innovation

Variable	Question in the survey	Mean	St. dev	Min	Max
stablelaw	To what extent do you agree or disagree with the following statements? Government officials' interpretations of the laws and regulations affecting this establishment are consistent and predictable	2.35	1.01	1	4
courts_function	Functioning of the courts: Do you think that the following present any obstacle to the current operations of your establishment?	1.87	1.22	1	5
macro_stab	Macroeconomic instability: Do you think that the following present any obstacle to the current operations of your establishment?	2.32	1.49	0	5
inform_compet	Practices of competitors in the informal sector: Do you think that the following present any obstacle to the current operations of your establishment?	2.37	1.50	0	5
finance_obst	Access to finance (availability and cost): Do you think that the following present any obstacle to the current operations of your establishment?	3.25	1.52	1	5
subcontract	In year XXX, did you subcontract any part of your production?	1.85	0.35	1	2
gov_borrow	For year XXX, please estimate the proportion of financing borrowed from state-owned banks and/or government agency.	0.51	5.10	0	100
quality_standards	Does this establishment have an internationally recognized quality certification	0.13	0.34	0	1
tech_license	Does your establishment use technology licensed from a foreign company?	0.10	0.30	0	1
avg_edu_worker	What is the average educational attainment of a typical production worker employed in your establishment?	2.84	0.91	1	5
bureaucracy	Over the last 12 months, in a typical week what percentage of total senior management's time was spent in dealing with requirements imposed by government regulations?	6.16	8.84	0	100
pervasiveness	To what extent do you agree or disagree with the following statement? It is common for establishments in this line of business to have to pay informal payments/gifts to get things done regarding customs, taxes, licenses, regulations, etc.	2.24	0.97	1	4

Figure A1. Structural Equation Modelling (SEM): Path diagram for potential mechanisms through which PI affects firms' product innovation (e2c1).



Note: *** p<0.01, ** p<0.05, +p<0.10.

Table A5. Robustness check: Propensity score matching (PSM) to compare domestic and foreign-owned firms

Panel A: Full sample versus PSM results

Variables/DVs	Model 21	Model 22
Insize	0.315*** [0.029]	0.304*** [0.051]
Inage	-0.022 [0.039]	-0.006 [0.068]
For comp	0.031 [0.022]	-0.009 [0.045]
Rel skill	0.083*** [0.022]	0.043 [0.042]
Mgm exp	-0.004 [0.003]	-0.005 [0.006]
Gov own	-0.002 [0.003]	0.007 [0.006]
No comp	0.058+ [0.030]	0.193*** [0.056]
ipr	-0.124 [0.078]	-0.061 [0.163]
polconiii	0.465** [0.219]	-0.103 [0.494]
hk	0.086** [0.035]	0.077 [0.072]
lnfdi	-0.024 [0.020]	-0.057 [0.042]
lnpatpop	0.049 [0.052]	0.083 [0.096]
lngdp	-0.117** [0.058]	-0.136 [0.110]
PI	-0.217*** [0.053]	-0.167 [0.120]
Exports	-0.019*** [0.007]	-0.004 [0.016]
Exports * PI	0.006*** [0.002]	0.000 [0.005]
ForeignDum	0.015 [0.334]	0.395 [0.460]
ForeignDum * PI	-0.005 [0.089]	-0.116 [0.126]
ForeignDum * Exports	-0.001 [0.011]	-0.018 [0.018]
ForeignDum * Exports * PI	-0.002 [0.004]	0.005 [0.006]
constant	0.476	0.729

	[0.720]	[1.401]
industry FE	Yes	Yes
N	3,014	720
Log Likelihood	-1927.658	-441.345
LR Chi Square	285.58	95.276
AIC	3915.316	940.69
BIC	4095.647	1073.488

Notes: In this table we report the nearest neighbour propensity score matched results. We cluster the standard errors by firm. **Model 14** presents the logit analysis of the treatment/control sample for the PSM tests (main sample, N=3,014 observations). **Model 15** presents the propensity score matched sample firm-level results (N=720 observations). Statistical significance is given as follows: +p<0.1, ** p<0.05, *** p<0.01.

Panel B: Propensity score matched sample descriptive statistics

Variable	Mean			t-test	
	Treated	Control	% bias	t	p>t
lnsize	108.21	95.84	6.3	0.75	0.452
lnage	21.68	21.56	0.1	0.02	0.988
Industry 1	0.26	0.26	-0.6	-0.08	0.933
Industry 2	0.10	0.08	5.7	0.92	0.357
Industry 3	0.04	0.04	0	0	1
Industry 4	0.03	0.03	0	0	1
Industry 5	0.06	0.09	-12.5	-1.39	0.165
Industry 6	0.00	0.00	.	.	.
Industry 7	0.05	0.05	0	0	1
Industry 8	0.10	0.10	0.8	0.12	0.902
Industry 9	0.09	0.09	1.8	0.26	0.797
Industry 10	0.26	0.25	0.7	0.09	0.932

Notes: We use firm size, firm age, and industry characteristics to match firms across two categories (foreign versus domestic). More details provided in Robustness checks section of the article.

Table A6. Robustness checks: Different proxies for PI

Variables	Model 23	Model 24	Model 25	Model 26	Model 27	Model 28
Insize	0.116*** [0.016]	0.294*** [0.039]	0.291*** [0.040]	0.288*** [0.040]	0.242*** [0.034]	0.244*** [0.033]
Inage	-0.004 [0.020]	-0.02 [0.048]	-0.011 [0.048]	-0.01 [0.048]	-0.04 [0.043]	-0.015 [0.042]
For comp	0.025** [0.012]	0.063** [0.028]	0.059** [0.027]	0.058** [0.028]	0.075*** [0.026]	0.069*** [0.025]
Rel skill	0.044*** [0.012]	0.094*** [0.028]	0.072** [0.031]	0.085*** [0.029]	0.063*** [0.024]	0.029 [0.025]
Mgm exp	-0.004** [0.002]	-0.009** [0.004]	-0.010** [0.004]	-0.010** [0.004]	-0.007+ [0.004]	-0.008** [0.004]
Gov own	-0.001 [0.002]	-0.004 [0.004]	-0.005 [0.004]	-0.005 [0.004]	-0.002 [0.004]	-0.003 [0.004]
No comp	0.038** [0.016]	0.108*** [0.039]	0.128*** [0.039]	0.120*** [0.039]	0.065+ [0.034]	0.104*** [0.034]
ipr	0.616** [0.259]	-0.892*** [0.165]	-0.772*** [0.173]	-0.364 [0.269]	-0.07 [0.084]	-0.173** [0.080]
polconiii	1.131** [0.525]	-0.195 [0.606]	-1.265*** [0.400]	-1.654*** [0.409]	0.072 [0.378]	-0.046 [0.366]
hk	-0.263** [0.118]	0.386*** [0.076]	0.525*** [0.087]	0.304*** [0.087]	0.034 [0.036]	-0.004 [0.038]
lnfdi	0.187** [0.075]	-0.367*** [0.080]	-0.374*** [0.077]	-0.301*** [0.065]	0.067*** [0.023]	-0.019 [0.025]
Inpatpop	-0.081 [0.058]	0.09 [0.103]	0.136 [0.091]	-0.105 [0.168]	0.044 [0.074]	0.024 [0.074]
lngdp	0.115 [0.075]	-0.562*** [0.163]	-0.986*** [0.295]	-0.681*** [0.194]	-0.158** [0.071]	-0.067 [0.060]
Exports	0.017 [0.039]	0.075 [0.094]	0.089 [0.092]	0.090 [0.093]	0.012 [0.085]	0.008 [0.083]
ForeignDum	0.027 [0.044]	0.140 [0.109]	0.145 [0.107]	0.136 [0.107]	0.108 [0.096]	0.087 [0.093]
Cost Terrorism	-0.256+ [0.141]					
Intern conflict		-0.414** [0.166]				
Ethnic tensions			-0.442*** [0.166]			
External conflict				-0.519*** [0.201]		
Battle deaths					-0.691*** [0.128]	

Gov change							-0.044*** [0.008]
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,546	1,743	1,743	1,743	2,049	2,049	

Note: All PI proxies and exports instrumented by city-industry averages of firm's perceptions of PI, and respectively involvement in exports. Only the second stage results are reported in this table due to space constraints. All models include a constant term (not reported). Robust standard errors are reported in parentheses. *** p<0.01, ** p<0.05, +p<10.

Further explanations about alternative PI proxies/variables:

We include the *cost of terrorism* for businesses (from World Economic Forum's Global Competitiveness Index; 0-7), the degree of *ethnic tensions* (International Country Risk Guide; 0-6) within a country attributable to racial, nationality, or language divisions, the degree of *internal conflict* (ICRG; 0-12), as an assessment of political violence in the country and its actual or potential impact on governance, the degree of *external conflict* (ICRG, 0-12) as an assessment both of the risk to the incumbent government from foreign actions (diplomatic pressures, withholding of aid, trade restrictions, territorial disputes, sanctions, cross-border conflicts). Subsequently, we recode these variables inversely so that they higher values for these indicators reflect greater PI. The degree of *government change* (Center for Systemic Peace) is a measure of the number of adverse regime changes between 1955 and 2004 multiplied by the degree of political change which has stemmed from the regime change, while the number of battle-related deaths (BRD) comes from the World Development Indicators. Battle-related deaths are deaths in conflicts between parties in the conflict dyad between 1994 and 2004, thus preceding the timing of innovation in the ES to capture the medium and long terms effects of instability (Sachs, 2005).

Table A7. Different proxies for PI (standardized). Marginal effects at the means (MEMs) †

Marginal effects	Cost Terrorism	External Conflict	Internal Conflict	Ethnic Tensions	Battle related deaths	Gov. change
Dy/dx	-0.027+ [0.014]	-0.088*** [0.024]	-0.065*** [0.023]	-0.095*** [0.020]	-0.089*** [0.014]	-0.054*** [0.015]

Notes: † Full models are estimated using IV probit with PI proxies and exports instrumented by labour productivity and average exporting in city-industry units. All models include industry-fixed effects, and control variables, similarly to our main estimations. Standard errors in parentheses. *** p<0.01, ** p<0.05, +p<10.

Table A8. Robustness checks using firm patenting. Probit estimations

	Model 29	Model 30	Model 31	Model 32	Model 33	Model 34	Model 35	Model 36
Variables / DV	Pat home	Pat abroad	Pat home	Pat abroad	Pat home	Pat abroad	Pat home	Pat abroad
Insales	-0.033 [0.027]	0.023 [0.036]	-0.038 [0.027]	0.019 [0.037]	-0.044 [0.028]	0.015 [0.037]	-0.048+ [0.028]	0.014 [0.038]

Insize	0.072	0.311***	0.063	0.275***	0.016	0.243**	0.01	0.215**
	[0.070]	[0.089]	[0.074]	[0.095]	[0.073]	[0.095]	[0.077]	[0.100]
Inage	0.095	0.540**	0.164	0.540**	0.083	0.533**	0.158	0.526+
	[0.191]	[0.259]	[0.195]	[0.267]	[0.192]	[0.266]	[0.197]	[0.275]
Rel skill	0.072	-0.007	0.092	0.025	0.071	-0.016	0.088	0.012
	[0.057]	[0.079]	[0.059]	[0.083]	[0.058]	[0.081]	[0.059]	[0.085]
Gov own	-0.639	1.035+	-0.68	1.217**	-1.184**	0.428	-1.221+	0.647
	[0.530]	[0.562]	[0.649]	[0.618]	[0.575]	[0.602]	[0.692]	[0.656]
No comp	-0.205***	-0.237**	0.206***	-0.259***	0.206***	-0.230**	-0.206***	-0.248**
	[0.074]	[0.095]	[0.076]	[0.098]	[0.074]	[0.097]	[0.076]	[0.101]
Mgm exp	0.002	-0.004	-0.001	-0.008	0.001	-0.003	-0.001	-0.006
	[0.008]	[0.011]	[0.008]	[0.011]	[0.008]	[0.011]	[0.008]	[0.011]
ipr	0.356***	0.032	0.355***	0.054	0.382***	0.071	0.378***	0.093
	[0.129]	[0.165]	[0.132]	[0.170]	[0.130]	[0.167]	[0.133]	[0.172]
polconiii	0.001	0.878	0.005	0.963	0.046	1.109+	0.037	1.158+
	[0.435]	[0.628]	[0.452]	[0.655]	[0.438]	[0.640]	[0.455]	[0.665]
hk	0.065+	0.075**	0.115***	0.125***	-0.091	-0.115	0.100***	0.113***
	[0.035]	[0.035]	[0.034]	[0.033]	[0.113]	[0.114]	[0.036]	[0.035]
Infdi	-0.013	0.103***	0.130***	-0.216***	0.092	-0.083	0.022	0.101***
	[0.020]	[0.020]	[0.026]	[0.024]	[0.070]	[0.068]	[0.025]	[0.024]
Inpatpop	0.045	0.120**	0.052	0.125**	0.178	0.076	0.235***	0.195***
	[0.049]	[0.049]	[0.048]	[0.049]	[0.156]	[0.157]	[0.066]	[0.067]
Ingdp	0.004	0.081	0.480***	-0.414***	-0.011	0.126	0.052	0.057
	[0.049]	[0.049]	[0.089]	[0.089]	[0.184]	[0.187]	[0.067]	[0.067]
exportdummy			0.106	0.823**			-0.023	0.733+
			[0.363]	[0.416]			[0.376]	[0.431]
exports			0.001	-0.027			0.008	-0.022
			[0.018]	[0.018]			[0.018]	[0.019]
foreignowned					0.342	0.430+	0.337	0.423+
					[0.297]	[0.236]	[0.297]	[0.239]
H1: PI	-1.801***	-0.273	1.812***	-0.204	1.614***	-0.025	-1.646***	-0.019
	[0.375]	[0.323]	[0.391]	[0.336]	[0.413]	[0.362]	[0.428]	[0.368]
H2: foreigndum * PI					-0.971	-1.144**	-0.971	-1.059**
					[0.782]	[0.511]	[0.785]	[0.527]
H3: exports * PI			0.092**	-0.035			0.073+	-0.021
			[0.041]	[0.031]			[0.038]	[0.031]
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	460	381	455	377	460	381	455	377
Log Likelihood	-241.87	-125.95	-237.07	-122.38	-237.23	-120.13	-232.64	-117.35
LR Chi Square	121.21	76.55	124.05	78.96	130.49	88.19	132.92	89.00
AIC	537.74	297.90	534.15	296.75	532.46	290.27	529.28	290.71
BIC	649.29	388.58	657.76	398.99	652.26	388.84	661.13	400.81

Notes: The two DVs employed in these estimations are whether the firm holds any patents at home (0/1) and respectively, abroad (0/1). All models include a constant term (not reported). *** p<0.01, ** p<0.05, +p<10.

APPENDIX B.

To capture political instability (PI) we are using one of the dimensions of governance developed by the World Bank (WGI) in its Governance Indicators series, namely political stability and absence of violence/terrorism (PV). This dimension is designed to capture “the perceptions regarding the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism” using a wide range of indicators listed below in **Table B1**. The PV dimension is then constructed by averaging together data from these underlying sources. The aggregation methodology is described in Kraay, Kaufmann and Mastruzzi (2010).

Table B1. Components of the WGI’s political stability and absence of violence/terrorism

Survey source	Data provider	Concept measured
Political Risk Index and Operational Risk Index (BRI), Quantitative Risk Measure in Foreign Lending (QLM)	Business Environment Risk Intelligence (BERI)	Fractionalization of political spectrum and the power of these factions Fractionalization by language, ethnic and/or religious groups and the power of these factions Restrictive (coercive) measures required to retain power Organization and strength of forces for a radical government Societal conflict involving demonstrations, strikes, and street violence Instability as perceived by non-constitutional changes, assassinations, and guerrilla wars
Global Risk Service	Global Insight, Boston, MA.	Military Coup Risk Major Insurgency/Rebellion Political Terrorism Political Assassination Civil War Major Urban Riot
Country Risk Service, Country Forecasts	Economist Intelligence Unit	Armed conflict Violent demonstrations Social unrest International tensions
Gray Area Dynamics	Cerberus Corporate Intelligence	Autonomy and Separatism Civil Unrest State of Emergency/Martial Law Active Terrorist Groups in the last two years
Global Competitiveness Survey	World Economic Forum	<i>Country terrorist threat</i> : Does the threat of terrorism in the country impose significant costs on firms?
Cingranelli Richards Human Rights Database	University of Binghamton	Frequency of political killings Frequency of disappearances Frequency of torture
Country Security Risk Ratings	iJET	Security Risk Rating
Institutional Profiles Database	French Ministry of the Economy, Finance and Industry and the <i>Agence Francais de Developpement</i>	Conflicts of ethnic, religious, regional nature Violent actions by underground political organizations Violent social conflicts
International Country Risk Guide	Political Risk Services	<i>Internal conflict</i> : Assesses political violence and its influence on governance <i>External conflict</i> : The external conflict measure is an assessment both of the risk to the incumbent government and to inward investment

		<i>Government stability.</i> Measures the government's ability to carry out its declared programs, and its ability to stay in office <i>Ethnic tensions:</i> This component measures the degree of tension within a country attributable to racial, nationality, language divisions
Political Terror Scale	University of North Carolina	Political Terror Scale
World Markets Online	Global Insight Business Risk and Conditions Global Insight	<i>Civil unrest:</i> How widespread <i>Civil Unrest:</i> How widespread political unrest is, and how great a threat it poses to investors. Demonstrations in themselves may not cause for concern, but they will cause major disruption if they escalate into severe violence. <i>Terrorism:</i> Whether the country suffers from a sustained terrorist threat, and from how many sources. Localization of the threat is assessed, and whether the active groups are likely to target businesses.

Source: <http://info.worldbank.org/governance/wgi/index.aspx#doc> (Accessed May 2019)

Endnotes

ⁱ Examples of those three types of innovations include a low-price version of lithium battery, a computer mouse that offered fewer core functions, or the nano car (Shankar and Narang, 2019).

ⁱⁱ Most missing observations stem from questions regarding firm innovation (product, process) and detailed ownership participation, which are non-sensitive politically, and moreover, intuitively unrelated.

ⁱⁱⁱ Furthermore, we employ the sample stratum, and the location and sector weights provided by the World Bank to ensure that our statistical inferences are valid (<http://www.enterprisesurveys.org/About-Us/Frequently-Asked-Questions>).

^{iv} The next round of surveys (2010/2011) includes only questions on firm patenting and is confined to six countries in Sub-Saharan Africa (Angola, Botswana, Burkina Faso, Cameroon, DR Congo, and Mali).

^v In our sample, the most politically stable country is Botswana (1.57) while the most unstable country is Burundi (4.84).

^{vi} These relatively high percentages are similar to those reported by prior studies on emerging (Lederman, 2010; Krammer, 2019) and African countries (Goedhuys, 2007). They reflect the relative greater focus of firms in these economies on “new to the market” or “new to the firm” innovations compared to firms in developed, mature economies that focus also on “new to the world” type of innovations. For this reason, firms in emerging economies report more product and process innovation than their counterparts in developed economies.

^{vii} We are grateful to one of the Reviewers for this suggestion.

^{viii} These studies propose both theoretical explanations (e.g., the role of African firms in global value chains and innovation networks; product life cycle rationales) but also empirical characteristics (i.e., the dominance of SMEs, the limited numbers of exporters in the overall population of firms).

^{ix} These additional results are available upon request.

^x We have also checked the endogeneity of our foreign ownership status but in this case the test has failed to reject the null of exogeneity (Wald=3.01).

^{xi} On average we have about 25 firms in a city-industry unit (standard deviation 19.63) and the correlation between export and instrument (0.59) is significant at 5 percent.

^{xii} First-stage instrumentation equations are also available upon request, but they are not reported here due to the lack of theoretical implications and the inherent space constraints.

^{xiii} The coefficient of PI remains significant but the other five dimensions of WGI are all highly among themselves (between 0.77 and 0.94) raising the VIF (variance inflation factor) of these estimations to unreliable levels (from 7.19 to 22.29) for an efficient estimation of these coefficients in the same regression.

^{xiv} The average correlation between PI levels within a country between 2007 and 2019 in our sample is 0.88.

^{xv} For instance, about 36 percent of the original dataset (1,700 firms) do not respond to the innovation and competition questions. We do not treat these non-responses as zeros but eliminate them from the dataset.

^{xvi} Given the cross-sectional nature of our dataset we are unable to examine such dynamic interactions between exporting and innovation via time lags.