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**GLOBAL VALUE CHAINS AND BUSINESS ENVIRONMENT:
WHICH FACTORS DO REALLY MATTER?**

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Abstract

This study attempts to assess the effect of business environment on the possibility of a firm to be part of a global value chain. Hence, it provides a bridge between two active literatures on global value chains (GVC) and business environment. Using a comprehensive firm-level dataset from the World Bank Enterprise Survey (WBES, with a special focus on the case of MENA countries), the contribution of the paper is threefold. First, it provides various and more consistent measures of GVC. Second, it examines the association between an array of business environment variables (infrastructure, labor conditions, access to finance, fiscal policy, enforcement of contracts, easiness of permits, informality, trade procedures and security) on the likelihood of integrating a GVC. Third, for these business environment variables, our paper compares both perception-based (based on firms' perceptions) and factual (based on facts whether from the WBES or from the Doing Business dataset) impediments that might be hindering a firm's participation in a GVC. Our main findings show that, for factual variables, the number of procedures to get electricity, the lack of credit bureau coverage, the number of tax payments, the cost to resolve insolvency, the number of documents to export, the number of procedures to register property and protecting minority investors have a negative and significant association with the integration into a GVC. For perception-based variables, the following variables are perceived as statistically significant constraints for GVC: transport, labor regulations and informality.

Keywords: Global Value Chains, Firms, MENA

JEL Classifications: F12, F23

ملخص

تحاول هذه الدراسة تقييم أثر بيئة الأعمال على إمكانية أن تصبح شركة ما جزءاً من سلسلة قيمة عالمية. ومن ثم ، تشكل جسراً بين اثنين من الأدبيات النشطة عن سلاسل القيمة العالمية وبيئة الأعمال. باستخدام مجموعة بيانات شاملة على مستوى الشركات مستمدة من مسح البنك الدولي للمنشآت - مع التركيز بشكل خاص على حالة بلدان الشرق الأوسط وشمال أفريقيا- فإن مساهمة الورقة تقدر بثلاثة أضعاف. أولاً ، توفر إجراءات متنوعة وأكثر تناسقاً مع سلاسل القيمة العالمية. ثانياً ، تدرس الورقة الارتباط بين مجموعة من متغيرات بيئة الأعمال (البنية التحتية ، ظروف العمل ، الوصول إلى التمويل ، السياسة المالية ، إنفاذ العقود ، سهولة التصاريح ، اللارسمية ، إجراءات التجارة والأمن) واحتمال دمج سلسلة قيمة عالمية. ثالثاً ، بالنسبة إلى متغيرات بيئة الأعمال هذه ، تقارن الورقة بين كل من التصورات المستندة إلى الإدراك (استناداً إلى تصورات الشركات) والتصورات الواقعية استناداً إلى حقائق سواء من مسح البنك الدولي للمنشآت، أو من مجموعة بيانات تقرير ممارسة أنشطة الأعمال التي قد تعرقل مشاركة المنشأة في سلسلة قيمة عالمية ، تبين النتائج الرئيسية التي توصلنا إليها ، أنه بالنسبة للمتغيرات الواقعية ، ارتباط عدد إجراءات الحصول على الكهرباء ، ونقص تغطية مكتب الائتمان ، وعدد مدفوعات الضرائب ، وتكلفة حل الإعسار ، وعدد مستندات التصدير ، وعدد إجراءات تسجيل الملكية وحماية المستثمرين من الأقليات ، ارتباطاً سلبياً وهاماً بالاندماج في سلاسل القيمة العالمية. أما بالنسبة للمتغيرات المستندة إلى الإدراك ، يُنظر إلى المتغيرات التالية على أنها قيود ذات دلالة إحصائية : النقل ولوائح العمل ، والسمة غير الرسمية.

1. Introduction

Developing countries are increasingly engaged in international production networks. This process has hugely increased since two decades and become one of the first production process in international trade. In 2013, 60% of the international trade is performed through GVC (UNCTAD, 2013). GVCs do not only represent the fractionalization process that unbundling supply chains into specific stages of production but also the international scattering of these stages and tasks. In order to reduce costs, most of the required inputs are now imported by the producing firm itself or sourced from other domestic firms creating production system out of borders. Hence, GVCs have deeply modified production and sales processes. This process can take on a number of ways for firms. Firms may marginally integrate the production process for one step or at the opposite fully engage in being vertically integrated. All participants to a GVC, whatever their characteristics, are linked to such activities through the value creation process. Thus, GVCs represent the opportunity for firms to produce and export a part of the supply chain depending on their comparative advantages, particularly for developing countries. In this way integrating a GVC may facilitate the export of firms from developing countries. As mentioned by Baldwin (2013), joining supply chain prevents firms for investing decades which increases the likelihood of exporting. Yet, we know little about incentives and constraints that influence firms to integrate GVC, making it hard to identify policy levers to address this problem. The quality of the legal, institutional, financial and regulatory systems plays a crucial role in the development of the performance of firms. Indeed, according to World Bank (2017) business regulations and their enforcement still vary widely across regions and countries.

The aim of this paper is to understand the crucial role of the business environment on the integration of firms into GVCs in the case of the MENA (Middle East and North African) countries. Despite heterogeneous performances, export dynamics of the MENA's countries have been largely unsatisfactory over the past two decades. As highlighted by Jaud and Freund (2015), MENA countries have exports superstars as their top firm is comparable to other countries. Except these champions, MENA countries suffer for a lack of large and productive firms at the top of the distribution. Significant efforts have been made in terms of trade openness and policy support to firm's transition, but MENA countries have failed to develop a group of large exporting firms which usually contribute to the success of the export dynamic of a country. Thus, improving GVC in the MENA region is crucial for two main reasons. First, MENA countries are poorly integrated in international trade. As integrating GVC may facilitate the upgrading and competitiveness of exported goods, it is important to analyze the constraints faced by firms in terms of business environment. Second, the political events in the MENA countries highlighted the urgency of creating jobs and redistributing the benefits of growth to the population. Hence, helping firms to integrate GVC may be relevant to the job challenges in MENA countries. Indeed, as highlighted by Brambilla, Lederman, and Porto (2012) and Frias, Kaplan, and Verhoogen (2012), exporters create more jobs and pay higher wage.

On a theoretical front, a large trade literature following Melitz (2003) shows that exporting firms are larger and more productive (Bernard, Eaton, Jensen and Kortum 2003; Bernard and

Jensen, 2004; Eaton, Kortum, and Kramarz 2004; Yeaple 2005; etc.). In this literature, trade liberalization implies a reallocation of resources among the most productive firms. In another strand of the literature, learning-by-doing and externalities, technical innovation through imports of intermediate goods and managerial efforts are other possible sources of productivity improvements that have been evidenced by different theoretical models (Ethier, 1982; Markusen, 1989; Grossman and Helpman, 1991; Schmidt, 1997; Kasahara and Rodrigue, 2008; etc.).

In parallel, there is a large empirical evidence suggesting that more integrated firms, defined as firms both exporting and importing, are larger, more productive and pay higher wages (Muûls and Pisu, 2009; Kasahara and Lapham, 2013; Smeets and Warzynki, 2013; De Hoyos and Iacovone, 2013; etc.). Nevertheless, the first analysis identifying these firms as ones integrated in GVC is Baldwin and Yan (2014). They find that Canadian firms that integrated into a GVC benefited from a rise in productivity by 5% than their counterparts during the first year and 9% four years after. At the opposite, firms getting out of a GVC decreased their productivity by 1% the first year and 8% four years after. Whereas the integration of a firm into a GVC can take a number of ways, the vast majority of the empirical literature focuses on one particular form of GVC that is processing trade. For Feng, Li and Swenson (2016), an increased use in imported intermediate inputs helps firms to develop the volume and the scope of their exports. The origin of imports plays an important role in the destination of exports. Indeed, importing intermediary inputs from high-income countries increases the probability to export to high-income countries. Therefore, under financial constraints, Manova and Yu (2016) find that firms are more likely to conduct more processing trade and pure assembly, whereas value added and profitability increase with ordinary trade. Dai, Maitra and Lu (2016) point out the fact that processing activities are linked to lower fixed costs of exporting. In Yu (2015), input and output tariffs reduction in China induced an increase in firm's productivity but this impact decreased with the share of firm's processing imports. Thus, a lower fixed cost of exporting and trade policy favored processing activities, inducing lower firm's productivity. According to Manova and Yu (2016), a large part of Chinese exports comes from foreign affiliates rather than domestic firms. Among these foreign affiliates Lu, Lu and Tao (2010) show that non-exporters are more productive than exporters. In line with the literature, they find the opposite for the non-foreign affiliates. Wang and Yu (2012) identify that ordinary trade firms are larger than one-way importers and exporters but are not necessarily more productive and capital intensive than only importers. Ju and Yu (2015) calculate an upstreamness index for all industries using the distance that is the number of stages that the product will go through before reaching the final demand. They find that upstream firms are more capital intensive. Thus, productivity and profitability are higher for these firms. For the MENA region, Del Prete et al. (2015) perform a micro firm level analysis, based on World Bank Enterprise Survey data for Egypt, Morocco and Algeria and show that the performance of firms, measured by several indicators, is positively associated with internationalization and GVC participation.

Our study provides a bridge between two active literatures on GVC and business environment. There is growing evidence that business environment impede firms'

performance (as Dollar, Hallward-Driemeier and Mengistae, 2005; Van Biesebroeck, 2005; Hallward-Driemeier, Wallsten and Xu, 2006; Fernandes, 2008; Goedhuys, Janz and Mohnen, 2010; Augier, Dovic and Gasiorok, 2012; Bah and Fang, 2015) and export activity (as Berman and Héricourt, 2010; Commander and Svejnar, 2011). In these studies, business environment in which firms operate, i.e. access to credit, regulatory and institutional environment and infrastructure, play a crucial role on their performance but with lot of heterogeneity. These studies mainly focused on total factor productivity, labor productivity, export status and ownership, while firm's integration into a GVC was never tackled.

Hence, using a comprehensive firm-level dataset from the World Bank Enterprise Survey (WBES), we use four different definitions of GVC to shed light on the importance of business environment in this integration process. The contribution of the paper is threefold. First, it provides various and more consistent measures of GVC. Second, it examines the “conditions” of an array of business environment variables under which integrating a GVC may be more likely to occur. Third, for these business environment variables, our paper compares both perception-based (based on firms’ perceptions) and factual (based on facts whether from the WBES or from the Doing Business dataset) impediments that might be hindering a firm’s participation in a GVC. To our knowledge this would be one of the first studies examining the impact of the business environment on firm’s integration to GVC, with a special focus on the case of MENA countries. Nevertheless, instead of establishing causal link between the business environment and firm’s integrated into a GVC, we are able to test more precisely correlates between GVC and a range of business environment measures.

Our main findings show that, for factual variables, the number of procedures to get electricity, the lack of credit bureau coverage, the number of tax payments, the cost to resolve insolvency, the number of documents to export and the number of procedures to register property exert a negative impact on the integrating into a GVC. For perception-based variables, the following variables are perceived as statistically significant constraints for GVC: transport, labor regulations and informality. When age and size are taken into consideration, newer and smaller firms seem to suffer more from these impediments, which reduce their likelihood of being part of a GVC.

The remainder of the paper is organized as follows. Section 2 presents some descriptive statistics on GVC and business environment. Section 3 is dedicated to the methodology. Section 4 presents our empirical findings and section 5 concludes.

2. Stylized Facts

At the world level, according to Del Prete et al (2015), GVC participation (defined as the sum of the foreign value added share and the indirect value-added exports’ share) has been increasing in most regions, from around 50% in 1995 to 54% 2007 worldwide. First, ASEAN countries are highly integrated in GVC (Figure 1). Interestingly and following the results of Foster-McGregor et al. (2015), North Africa has some of the highest rates of GVC participation, matching the levels found in Europe (65% in 2007) thanks to the development of automotive industries, particularly in Morocco.

As highlighted by the literature, exporters and importers are few, bigger and more productive. A foreign-ownership status may be an indicator of integration into a GVC as foreign-owned firms may serve as exporting platforms for foreign countries. An international certification may also be required in vertically fragmented production processes, providing another indicator of GVC integration. This is why we adopt four definitions of GVC as follows. First, the least strict definition includes firms that export and import simultaneously. Second, two stricter definitions are related to firms who are simultaneously exporters and importers and have either an international certification or a share of its capital owned by a foreign firm. The strictest definition combines the four criteria altogether (see Figure 2). On the one hand, definition 2 and definition 3 can be seen as substitutes. Indeed, while certification is a token of the level of quality of goods, foreign investments in developing countries can be expensive and risky. Thus, rather than investing in a domestic firm, foreign companies may prefer to work with certified firms at first in order to control and secure transactions across borders. On the other hand, certification and foreign ownership can be seen as complements (definition 4). Foreign companies with certification can invest in domestic firms and implement their certification in this new firm or having a certification first can attract foreign companies. Our preferred definition is the strictest one since it guarantees that a firm has several characteristics increasing its participation in a GVC, namely exporting, importing, with a foreign certification and has foreign owner. It is worthy to note that this paper focuses only on the manufacturing sector.

Table 1 shows the distribution of firms engaging in a GVC based on different definitions and using survey weights. Indeed, a large part of the firms (66.2 percent) are producing and serving the domestic market only. Exporters at the world level are minor as they do not represent more than 12.5 percent of the total number of firms. This is in line with Freund and Pierola (2015) who found that the top five firms make up 30% of total exports in different countries. These firms are called export superstars. While importers are more frequent, those having a two-way trade activity represent 13.2 percent of the total number of firms. Moreover, more than 50 percent of those engage in export activity or in a two-way trade activity have an international certification. For those only importing it represents 21 percent. By contrast, 15.2 percent of the two-way firms have both an international certification and a foreign ownership. This shows that the strictest definition of GVC applies to a relatively small share of firms in our dataset.

Looking at the regional dimension of GVC (Table 2), two main remarks are worth to be mentioned. First, on average 2 percent of firms are two-way firms with a foreign ownership and an international certification. Second, internationally certified firms are chiefly concentrated in Europe. The MENA region is performing slightly better than South-Asia. With 13% of firms having a two-way trade activity, the MENA region is in the average of our sample.

It is important to note that, in our sample, we find that larger firms are more likely to have a foreign capital (Figure 3), get an international certification (Figure 4), having either a two-

way trade activity and an international certification (Figure 5) or a two-way trade activity and a foreign ownership (Figure 6), or having the four aspects simultaneously (Figure 7). This confirms the facts that SMEs, while being in a dire need to be part of a GVC to expand, are still facing several impediments hindering their growth and hence their engagement in a GVC.

Table 3 presents the main obstacles characterizing the business environment in different region based on the firms' perceptions. The most severe obstacle in the MENA region, as reported by the firms, are chiefly political instability, electricity, access to finance, corruption, tax rates and practices from the informal sector. This is similar to East Asia and Pacific (EAP) and Latin America and the Caribbean (LAC) where firms reported that the most severe obstacles are also tax rates, access to finance and competition from the informal sector. Hence, most of the developing countries are still suffering from several dimensions in their business environment, which in turn affects their performance and hence their engagement in a GVC.

Furthermore, the Doing Business dataset presents more facts than perceptions as it is presented in Table 4. In most of the indicators, the MENA region is performing better than Latin America (LAC) and Sub-Saharan Africa (SSA) and worse than East Asia and Pacific and Europe and Central Asia. A more detailed look shows that time to enforce contract is higher in LAC and SSA than in MENA. Yet, time to resolve insolvency is the highest in MENA and in SSA. While time to register property is low in the MENA region, several countries do not have laws or do not enforce laws related to property rights. As per trade procedures, time to export and to import is higher than LAC and East Asia and Pacific, which increases the cost of trade and hence explain why the MENA region is still underperforming in exports. Finally, whereas time to get electricity is lower in the MENA region than in other regions, electricity is still reported as one of the most important challenges faced by firms (Table 3).

3. Methodology

In this paper, we use a large firm-level survey data that includes information on firm's location, sales, value added, output, exports, imports, date of creation, location, investment, etc. and firm's perception of the business environment. Specifically, we use *The Enterprise Surveys* conducted by the World Bank⁴. For the MENA countries, these enterprise surveys are available for Egypt (2013), Jordan (2013), Lebanon (2013), Morocco (2013), Tunisia (2013) and Yemen (2010, 2013)⁵. This survey covers all manufacturing sectors: food , textiles, garment, leather, chemicals, wood and paper, rubber and plastics, metals and mechanical and electrical and electronic industries.

We investigate the effects of different dimensions of the business environment on firm-level integration to GVC while taking into account firm characteristics. Our variable of interest concerns the integration of firms to GVC. We will create a GVC status of a firm according to

⁴ The World Bank's Investment Climate Surveys are available upon request (<http://www.enterprisesurveys.org/>).

⁵ We drop Yemen from the empirical part given the extremely low number of observations.

four dimensions; (1) export status (2) imports of inputs (3) foreign ownership and (4) the firm comply with at least one international standard. Hence, we will run different regressions for each of these definitions (see Figure 2). As the decision to integrate GVC is a discrete variable by definition equal to 0 or 1, the probit model will be appropriate. Hence, we will estimate the following regressions:

$$Prob(X_{ijlct}) = \begin{cases} 1 & \text{if } \beta_0 + \beta_1'V_{ijlct} + \beta_2'X_{ijlct} + \delta_j + \delta_c + \delta_t + \varepsilon_{ijlct} > 0 \\ 0 & \text{otherwise} \end{cases} \quad (1)$$

$$Prob(X_{ijlct}) = \begin{cases} 1 & \text{if } \beta_0 + \sum_k \beta_1'(V_{ijlct} * I^k) + \beta_2'X_{ijlct} + \delta_j + \delta_c + \delta_t + \varepsilon_{ijlct} > 0 \\ 0 & \text{otherwise} \end{cases} \quad (2)$$

with i, j, l and c respectively the firm, the industry, the region and the country, X_{ijlct} , is a vector of control variables including firms' characteristics (size, age, etc.), δ_j , δ_c and δ_t are industry, country and year fixed effects, respectively, I^k is a dummy variable identifying the firm type according to size or age (defined 1 if the firm falls within the highest 50% and 0 otherwise) and ε_{ijlct} is an unobserved error term. The business environment indicators, V_{ijlct} , will be measured as location-industry-country-year averages of firm-level observations while excluding the individual firm's own responses. In consequence, the business environment in a specific industry j , location l and country c is assumed to be common for all firms in a given industry j , location l , and country c as well as being time invariant.

Our vector of business environment measures includes nine groups of variables measuring the investment climate that are likely to affect the GVC⁶:

- The first group incorporates infrastructural variables such as electricity, telecommunication and transportation.
- The second is dedicated to fiscal policy including tax administration and tax policy.
- Third, a bunch of variables measuring the labor market regulations are considered.
- Fourth, we include several variables measuring access to finance.
- Fifth, we measure the effect of trade facilitation and customs procedures.
- Sixth, we include variables measuring security and risks coming from corruption, theft, problems with courts and political instability.
- Seventh, we include some variables measuring the effect of the informal sector.
- Eighth, several variables measure the effect of time to obtain different permits are taken into consideration.
- Finally, we examine the effect of time to enforce contract and insolvency.

It worthy to note that for each dimension, we introduce three sets of variables (when available). The first set includes perception-based variables from the WBES. These constraints are dummy variables that take the value of 1 if the obstacle is severe or major and zero otherwise. The second set encompasses factual variables also from the WBES. Finally, the last set of variables come from the Doing Business dataset (that measures objectively different characteristics of the business environment). Thus, instead of establishing links

⁶ For the variables definition, see Appendix 1.

between GVC and the business environment as proxied by subjective and global measures, we will be able to test more precisely correlates between firm level-performance and a range of objectives variables when available, which captures the key features of the business environment. The variables are summarized in Appendix 1 in Table A1.

Since the effect of business environment variables is not homogenous across different firms, we distinguish between on the one hand small and large firms and on the other between old and new firms. Such a distinction, from a policy perspective, is crucial to draw some conclusion on how to promote the insertion of new and small and medium firm into GVC.

As discussed in Fernandes (2008) the lack of time variability will prevent us from using firm-level fixed effects estimation, and exploring the impact of changes over time and influences the probability of finding significant coefficients. In line with the literature, this procedure then has implications for issues of potential endogeneity. It is therefore important to note that our results should be interpreted more as correlates between measures of GVC and the array of business environment variables. Moreover, to partially overcome this problem, we used location-industry-country averages minus individual firm's own responses we will reduce the risk of endogeneity between the business environment and firm-level GVC status. Finally, we use information on the survey design and weights in order to control for the potential over-sample of large firms in the database.

4. Empirical Findings

Tables 5-6 shows the results for the association between business environment variables and the likelihood of engaging in a GVC. For the sake of brevity, we only report coefficients associated to business environment variables with Probit model (results with the OLS model are reported in the appendix). In Tables 7-10, we report the results of the Probit model by firm size and firm age⁷. It is worthy to note that, given the large number of tables, results with the OLS are presented in details in Appendix 2.

First, for electricity, when factual variables are compared to perception-based ones, it is clear that the existence of generators exerts a positive and significant effect on participating in a GVC. The effect is higher for larger firms when GVC is measured by a two-way trade activity, a two-way activity and a certification or a two-way certification and foreign ownership. This is in line with the literature on electricity and growth of firms where one of the starkest examples of infrastructure failures is poor electricity. The latter can significantly reduce output as electricity is essential for lights, motors, and machines (Hulten, Bennathan and Srinivasan, 2006). The existence of a generator helps overcome such a barrier. At the institutional level, the number of procedures to get electricity have a negative and significant effect on all the GVC definitions with no real differences according to the size or the age of the firms. At the opposite, the time to obtain electricity is negatively correlated with all the GVCs definition. These results can highlight the fact that once firms overcome heavier

⁷ Newer (older) firms are those whose age is lower (greater) than the median age. Smaller (larger) firms are those whose age is lower (greater) than the median size.

procedures to obtain electricity they benefits from an electric connection even with a long time spent to get it. Firms do not seem to be affected differently by such an impediment. At the perception level, obstacles related to transport have also a deterring effect on GVC for smaller firms (see Table 7). Whereas obstacles related to telecommunication is a constraint highlighted by larger firms entering in a two-way trade activity or a two-way trade activity with certification

Second, GVC requires flexible labor regulations and skilled workers that are able to deal with advanced machines and equipment. This is why, among the perception-based variables, complicated labor regulations have a negative and statistically significant effect on integrating a GVC for small firms and for both old and new ones. This is in line with the literature that showed that the effect of trade openness on employment depends on how the labor market adjustment process occurs (Selwaness and Zaki, 2018). In other words, more flexible labor market regulations will make the adjustment quicker and easier which encourage firms to participate in GVC.

Third, for access to finance, the perception of the latter is insignificant (Table 5). Indeed, the latter are still suffering from several impediments that prevent them from having a sustainable and significant access to finance. This is in line with El-Said et al (2015) who showed that limited access to finance exerts a negative effect on trade performance and especially for SMEs since it prevents them from expanding, becoming more productive and hence improving their trade performance. For factual variables, while larger firms are positively affected by self-financing to be part of a GVC, the likelihood of being part of a GVC is negatively affected by bank financing for firms in the MENA region (whether they are large or small). This might be attributed to the high cost of borrowing and the complexity of its procedures. Bank account increases the probability for large firm to integrate a GVC dimension. Age does not help firm to overcome financial constraints. However, financial infrastructures are important. The credit registry coverage is positively linked with the integration into a GVC. Whereas the credit bureau coverage, representing the exchange of credit information among creditors, has a negative and significant correlation with all the GVC definitions.

Fourth, as per fiscal policy, the overall effect of the perception of tax administration is insignificant. Moreover, for factual variables, costly and time-consuming procedures do matter for GVC. Indeed, both the number of payments and time to pay taxes have a negative and significant effect on GVC with a higher effect for smaller. Furthermore, total tax rate in percentage of profit is positively correlated with the two definitions of GVC using the foreign ownership (which are likely to be the firms that pay the higher level of tax) and labor tax and contributions is negatively correlated for firms with a two-way trade activity only. High or non-transparent tax rates do not allow a permissive enough climate for businesses without foreign ownership to grow and thrive through three main channels: effect on profits, on hiring employees (and thus expand) and its legal status. In fact, the higher the tax rates, the lower the profits and the lower the likelihood to invest, expand and engage in a GVC. Second, the

higher the taxes, the lower the firm will hire workers leaving it micro or small and hence do not become medium or large sized firm.

Fifth, enforcement of contracts and resolving insolvency matter for GVC regardless the firm's size or age. Indeed, while the number of procedures and time to enforce contracts has a higher negative effect GVC for smaller firms, newer ones (for the two-way trade definition) and older ones (for other definitions) are more affected. Moreover, the time and cost to resolve insolvency have a statistically significant and negative effect on GVC whatever the size and the age of the firm. Resolving insolvency matters for firms since a good insolvency regime should prevent premature liquidation of businesses and discourage lenders from issuing high-risk loans. Hence, firms become more sustainable and hence are more likely to be part of a GVC.

Sixth, for obtaining permits, it is worthy to note that, at the perception level, this variable is not significant. By contrast, when it comes to fact-based variables, time and procedures to register property are negative and significant for most of the definitions as well as for all types of firms (regardless their age and their size). We find the same with the time for construction permits. Yet, as it was mentioned before, the effect is stronger for smaller firms who face more impediments while registering. We find significant and positive correlation with costs of registering and construction permits for all the definitions and more specifically for larger firms. Our results might highlight the fact that only large firms are able to pay high level of costs of permits and be a part of a GVC.

Seventh, informality, whether measured by perceptions or by facts, exerts a negative effect on the participation in a GVC. When age and size are considered, smaller and newer firms suffer more from informality. This is due to the fact that most of the firms in the developing countries escape the red tape cost and excessive tax payments and prefer to remain in the informal sector, which hinders their expansion and hence reduces their participation in a GVC.

Eighth, regarding trade procedure, while we obtain some counter-intuitive results for time and cost to trade, the only negative and significant variable is the number of documents to export and to import for all the definitions taken into consideration with a slightly higher effect for small firms. The number of documents seems to prevent firms to start a trade activity since they bear bureaucratic trade procedures. This is why improving customs procedures will encourage firms to belong to a GVC. This can place by reducing the lack of transparency, avoiding duplication of documentation requirements and automating data submission procedures. It is worthy to note that the correlation with costs might represent self-selection of firms, only those that can overcome the costs are likely to integrate a GVC.

Finally, and surprisingly, whereas risks across political instability are among the major obstacles for MENA region firms, corruption or problems with courts do not appear significant among the perception-based variables. However, factual variables measured by the protection of minority investors and the share of value of products lost in transit due to

breakage or spoilage have a significant effect on most of the GVC definitions. They also matter more for newer and younger firms.

As a robustness check, we remove the certification from the GVC definition and introduce it as an independent variable. The latter exerts a positive and statistically significant effect on different GVC definitions. Meanwhile, our results do not change since from the perspective of firms' perceptions, transport and informality have a negative effect on GVC. Moreover, among factual variables, the existence of a generator and self-financing still have a positive and significant effect on GVC, whereas bank financing, insecurity and informality impede the development of GVC (see Tables A25 and A26 in Appendix 2).

5. Conclusion and Policy Recommendations

This study attempts to assess the effect of business environment on the possibility of a firm to be part of a global value chain. Hence, it provides a bridge between two active literatures on global value chains (GVC) and business environment. Using a comprehensive firm-level dataset from the World Bank Enterprise Survey (WBES, with a special focus on the case of MENA countries), the contribution of the paper is threefold. First, it provides various and more consistent measures of GVC. Second, it examines the impact of an array of business environment variables (infrastructure, labor conditions, access to finance, fiscal policy, enforcement of contracts, easiness of permits, informality, trade procedures and security) on the likelihood of integrating a GVC. Third, for these business environment variables, our paper compares both perception-based (based on firms' perceptions) and factual (based on facts whether from the WBES or from the Doing Business dataset) impediments that might be hindering a firm's participation in a GVC.

Our main findings show that, for factual variables, the number of procedures to get electricity, the lack of credit bureau coverage, the number of tax payments, the cost to resolve insolvency, the number of documents to export and the number of procedures to register property exert a negative impact on the integrating into a GVC. For perception-based variables, the following variables are perceived as statistically significant constraints for GVC: transport, labor regulations and informality. When age and size are taken into consideration, newer and smaller firms seem to suffer more from these impediments, which reduce their likelihood of being part of a GVC.

From a policy stand point, this paper helps understand numerous relevant issues in the MENA region, especially how GVC can be promoted to increase the productivity of firms and hence, boost their expansion. This is chiefly attributed to four sets of policies. First, a more transparent fiscal policy with low and less onerous tax rates will help firm become part of a GVC. Second, improving infrastructure and especially spending in power generation and electricity will empower different firms and let them specialize in more complex products that might be a regular and more sustainable source of power. Third, enforcing and implementing transparent laws for registering property is crucial for firms to be part of GVC. Finally, regulating the informal sector to reduce the negative effect implied by the practices of informal firms should also be on the agenda of developing countries to increase their

engagement in the GVC. Therefore, our paper is in line with Rodrik (2018) who argued that we should rely more on “domestic integration”. The latter means improving the capabilities and the fundamentals of the economy through investment in human capital, business environment and governance. Thus, more efforts should be deployed to strengthen the connection between the highly productive global firms, potential local suppliers, and the domestic labor force. This cannot take place without improving the business environment with the aforementioned dimensions in order to facilitate such an integration.

Yet, as highlighted also by Rodrik (2018), it is important to consider the issue of GVC with caution since the latter, at world level now, are intensive in new technologies that may present a double threat to low-income countries. First, they are generally biased towards skills which reduces the comparative advantage of developing countries that are endowed in unskilled labor and specialized in traditionally labor-intensive manufacturing activities. Second, GVCs make it harder for them to use their labor cost advantage by reducing their ability to substitute unskilled labor for other production inputs.

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Table 1. GVC characteristics – Different definitions

		Domestic	Exporter only	Importer only	Two-way	Total
FDI	Not certified	1.4%	3.2%	3.9%	6.2%	2.6%
	Certified	1.1%	4.8%	2.7%	15.2%	3.7%
No FDI	Not certified	75.9%	43.9%	75.1%	39.8%	67.0%
	Certified	21.6%	48.1%	18.3%	38.8%	26.7%
Total		60.2%	12.5%	14.1%	13.2%	100%

Source: Authors' own elaboration using the WBES dataset (with weights).

Table 2. GVC characteristics – Different definitions (by region)

	Two way	GVC Cert	GVC For	GVC All
<i>East Asia & Pacific</i>	9%	6%	3%	2%
<i>Europe & Central Asia</i>	27%	15%	5%	3%
<i>Latin American & Caribbean</i>	13%	5%	3%	2%
<i>Middle East and North Africa</i>	13%	6%	2%	1%
<i>South Asia</i>	7%	3%	0%	0%
<i>Sub-Saharan Africa</i>	15%	7%	4%	2%
<i>All</i>	13%	7%	3%	2%

Source: Authors' own elaboration using the WBES dataset (with weights).

Table 3. Biggest obstacle in the business environment (by region)

	All	EAP	ECA	H-NON	H-OECD	LAC	MENA	SA	SSA
Access to finance	15.5	11	14.2	14.8	11.7	14.3	10.2	12.4	22.5
Bus. licensing	2.6	4.1	2.1	2	2.7	3.7	2.8	1.8	1.9
Corruption	7.4	8.7	7.9	3.7	2.6	8	7.8	9.3	8
Courts	1	1.2	1.6	0.4	1.5	1.2	1.1	0.4	0.5
Crime, theft	4	2.9	1.4	6.7	2.5	9.1	1.9	2.6	3.4
Customs reg.	3.9	2.7	3.4	7	1.1	4.7	3.8	1.9	4.8
Electricity	9.3	5.9	5.4	9.6	2.5	7.8	14.1	20.3	12.8
Inadeq. workforce	6.8	7.3	5.8	16.3	12.5	9.8	5.4	3.4	2.2
Labor reg.	3	3.1	1.8	3.5	8.7	3.6	2.8	5.1	1.1
Political instab.	11.3	10.9	13.1	3	9.2	6.9	28.4	17.9	9.8
Prac. informal	12.5	16.3	15.5	11.1	10.5	14.1	7.4	6.2	11.5
Tax admi.	3.7	3.3	4.7	2.4	5.5	2.7	1.6	2.7	4.5
Tax rates	12.4	11.3	18.6	14.6	22	10.1	8.3	6.9	9.2
Transportation	2.9	4.8	2.2	4	3.8	2.5	1.4	3.6	2.8

Source: Authors' own elaboration using the WBES dataset.

Notes: (i) Figures represent share of firms reporting each aspect as the biggest obstacle to their business.

(ii) EAP (East Asia & Pacific), ECA (Europe & Central Asia), H-NON (High income: non-OECD), HOECD (High income: OECD), LAC (Latin America & Caribbean, MENA (Middle East & North Africa), SA (South-Asia), SSA (Sub-Saharan Africa).

Table 4. Business Environment – Doing Business

	EAP	ECA	LAC	MENA	OECD	SSA	SA
Time required to enforce a contract (days)	534.4	528.1	763.5	663.3	548.5	664.2	1101.7
Time to resolve insolvency (years)	2.4	2.0	2.9	3.0	1.8	3.0	2.6
Time required to register property (days)	66.4	24.9	61.8	34.6	24.3	59.6	112.7
Time required to start a business (days)	34.6	13.9	34.3	20.4	10.8	30.9	18.6
Time to export (days)	18.9	18.1	16.9	19.1	10.9	30.6	33.7
Time to import (days)	20.0	18.6	18.6	23.1	10.1	37.9	34.8
Time to prepare and pay taxes (hours)	207.3	204.9	362.1	219.6	175.2	304.4	288.6
Time required to get electricity (days)	92.2	110.2	65.3	85.7	89.0	136.1	148.7

Source: Authors' own elaboration using the Doing Business dataset.

Note: EAP stands for East Asia & Pacific, ECA Europe & Central Asia, LAC Latin America & Caribbean, MENA Middle East & North Africa, OECD OECD members, SSA Sub-Saharan Africa and SA South Asia.

Table 5. Summary of Results – Aggregate Regressions

		Probit			
		Two way	GVC cert.	GVC for.	GVC all
1-Infrastructure					
Factual	Power Outage	0.385 (0.264)	0.641** (0.300)	0.570 (0.406)	1.187*** (0.402)
	Generator	1.051*** (0.297)	1.249*** (0.371)	0.580 (0.427)	0.480 (0.484)
	Water	0.159 (0.226)	0.352 (0.353)	0.179 (0.561)	0.417 (0.592)
Perceptions	Electricity	0.341 (0.231)	0.531** (0.262)	-0.0109 (0.339)	0.306 (0.365)
	Telecom	0.521* (0.287)	0.840** (0.380)	0.347 (0.477)	0.512 (0.540)
	Transport	-0.124 (0.282)	0.129 (0.333)	-0.940** (0.421)	-1.241** (0.526)
Doing Business	Proc. Getting Elec.	-4.960*** (0.911)	-4.023*** (0.533)	-4.145*** (0.933)	-3.692*** (0.709)
	Time Getting Elec.	3.899*** (1.213)	2.530** (1.223)	3.487*** (1.139)	2.384** (0.969)
	Cost Getting Elec.	0.000125 (0.000175)	-3.44e-05 (0.000148)	0.000198 (0.000152)	2.59e-05 (0.000130)
2-Labor					
Perception	Labor	-0.367 (0.316)	-0.241 (0.414)	-0.784* (0.446)	-1.351** (0.608)
	Education	0.381 (0.237)	0.178 (0.264)	0.423 (0.357)	0.299 (0.370)
3-Finance					
Factual	Self finan.	-0.180 (0.348)	0.647 (0.459)	1.752*** (0.522)	1.882*** (0.614)
	Bank finan.	-0.667 (0.547)	-1.106 (0.771)	-2.432** (1.038)	-2.704** (1.235)
	Account share	0.587** (0.299)	0.779* (0.434)	0.197 (0.573)	0.720 (0.694)
	Overdraft fac.	-0.106 (0.247)	0.119 (0.261)	-0.0512 (0.297)	-0.0296 (0.352)
	Credit loan	-0.0711 (0.252)	-0.207 (0.393)	-0.776* (0.453)	-0.894 (0.570)
Perception	Finance	0.285 (0.238)	0.0329 (0.264)	-0.362 (0.312)	-0.572 (0.378)
Doing Business	Credit regis. Cov	0.0438*** (0.00994)	0.0367*** (0.00539)	0.0336*** (0.0103)	0.0322*** (0.00638)
	Credit bureau cov	-0.0704*** (0.00943)	-0.0530*** (0.00586)	-0.0466*** (0.0149)	-0.0424*** (0.00789)
4-Fiscal					
Perceptions	Tax rate	0.415* (0.217)	0.230 (0.283)	0.143 (0.401)	-0.0576 (0.492)
	Tax admin.	0.211 (0.266)	0.125 (0.406)	0.0980 (0.518)	0.232 (0.593)
Doing Business	Number of pay.	-0.967*** (0.102)	-0.674*** (0.0894)	-0.852*** (0.0905)	-0.654*** (0.0419)
	Time to pay tax	-1.270*** (0.0651)	-0.841*** (0.129)	-0.985*** (0.155)	-0.734*** (0.127)
	Total tax rate	0.0234 (0.0297)	0.0244 (0.0204)	0.0403*** (0.0145)	0.0305*** (0.0118)
	Profit tax	0.00610 (0.0245)	-0.0121 (0.0167)	0.0219 (0.0202)	-0.00182 (0.0149)

	Labor tax and cont	-0.0722** (0.0283)	-0.0298 (0.0245)	-0.0279 (0.0277)	-0.0101 (0.0177)
<i>5-Enforcing</i>					
Doing Business	Proc. Enf. Contracts	-13.34*** (2.067)	-7.550*** (2.095)	-10.17*** (2.894)	-7.040*** (2.129)
	Time Enf. Contracts	-1.190** (0.539)	-0.613 (0.536)	-1.076** (0.419)	-0.602 (0.434)
	Cost Enf. Contracts	-0.0411 (0.139)	-0.0859 (0.0971)	-0.130* (0.0742)	-0.116* (0.0594)
	Time Res. Insolvency	-0.862 (0.577)	-0.971*** (0.241)	-0.846* (0.464)	-0.901*** (0.232)
	Cost Res. Insolvency	-0.0900*** (0.0129)	-0.0641*** (0.00403)	-0.0723*** (0.0103)	-0.0591*** (0.00651)

Source: Authors' own elaboration based on STATA output.

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table 6. Aggregate Regressions (continued)

		Probit			
		Two way	GVC cert.	GVC for.	GVC all
6- Permits					
Perception	Permits	0.302 (0.342)	0.329 (0.487)	0.877* (0.529)	0.908 (0.586)
	Proc Start bus.	1.454 (3.050)	2.834 (1.835)	1.988 (2.485)	2.769** (1.384)
	Time start bus.	-1.683 (6.482)	-3.699 (5.767)	-7.534* (4.069)	-5.678 (4.086)
	Cost start bus.	0.0161 (0.0395)	-0.00396 (0.0419)	-0.0456 (0.0590)	-0.0282 (0.0458)
	Proc cons perm.	-0.578 (0.686)	0.218 (0.536)	-0.505 (0.609)	0.112 (0.415)
Doing Business	Time cons perm.	-0.925** (0.431)	-0.548 (0.374)	-0.880*** (0.333)	-0.513* (0.292)
	Cost cons perm.	0.198*** (0.0555)	0.147*** (0.0465)	0.138** (0.0632)	0.118** (0.0483)
	Proc regis prop.	-1.536*** (0.323)	-1.280*** (0.167)	-1.198*** (0.356)	-1.129*** (0.228)
	Time regis prop.	-1.044*** (0.246)	-0.742*** (0.215)	-0.655** (0.305)	-0.556** (0.226)
	Cost regis prop.	0.162*** (0.0384)	0.0926** (0.0448)	0.130*** (0.0364)	0.0809** (0.0363)
7- Informality					
	Informality	-0.128 (0.211)	-0.797*** (0.307)	-1.328*** (0.382)	-1.251*** (0.466)
Factual	Sales inf. Pay.	0.0169 (0.0288)	-0.000215 (0.0105)	-0.00770 (0.00931)	-0.00199 (0.00868)
Perception	Informality	-0.325 (0.228)	-0.797*** (0.297)	-0.776** (0.353)	-0.755 (0.465)
8- Trade procedures					
Perception	Trade obs.	0.431 (0.309)	0.905*** (0.339)	0.410 (0.538)	0.623 (0.568)
	Doc to exp.	-1.666*** (0.218)	-0.913*** (0.309)	-1.399*** (0.214)	-0.939*** (0.234)
	Doc to imp.	-1.650*** (0.524)	-0.772 (0.551)	-1.465*** (0.460)	-0.851* (0.476)
Doing Business	Cost to exp.	1.706 (1.369)	1.739*** (0.626)	0.715 (1.108)	1.232** (0.555)
	Cost to imp.	2.239*** (0.584)	1.151*** (0.388)	0.803 (0.540)	0.603* (0.346)
	Time to exp.	2.223*** (0.800)	1.582** (0.683)	1.032 (0.877)	1.098 (0.672)
	Time to imp.	2.210** (0.925)	1.423** (0.690)	1.327 (0.982)	1.101 (0.728)
9-Security					
Factual	Theft	-0.0271 (0.0235)	-0.0128 (0.0359)	-0.223** (0.100)	-0.232** (0.108)
	Break	-0.116***	-0.0774**	-0.0712*	-0.0602

		(0.0258)	(0.0325)	(0.0396)	(0.0421)
	Courts	0.197	-0.0917	0.402	0.403
		(0.354)	(0.522)	(0.606)	(0.699)
	Crime	0.230	-0.183	-0.929	-1.104
Perception		(0.293)	(0.421)	(0.669)	(0.860)
	Political stab.	0.479*	0.254	0.0575	-0.0279
		(0.266)	(0.300)	(0.291)	(0.338)
	Corruption	0.216	0.113	0.117	0.294
		(0.213)	(0.251)	(0.322)	(0.351)
	Protec Inv. (Disc.)	-0.0500	-0.182	-0.200	-0.219
Doing Business		(0.281)	(0.258)	(0.258)	(0.195)
	Protec Inv. (Liab.)	0.209**	0.196***	0.187***	0.178***
		(0.0828)	(0.0362)	(0.0663)	(0.0382)

Source: Authors' own elaboration based on STATA output.

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table 7. Summary of Results – By firm size (probit model)

		Two way		GVC cert.		GVC for.		GVC all	
		Small	Large	Small	Large	Small	Large	Small	Large
1-Infrastructure									
Factual	Generator	0.758** (0.334)	1.482*** (0.402)	0.584 (0.581)	1.719*** (0.464)	-0.569 (0.651)	1.045* (0.544)	-1.107 (1.058)	0.916 (0.583)
	Telecom	0.0827 (0.339)	1.120** (0.448)	-0.598 (0.920)	1.498*** (0.464)	-3.595 (2.204)	1.018* (0.567)	-15.11*** (4.298)	1.089* (0.636)
	Transport	-0.549 (0.412)	0.365 (0.361)	-0.768 (0.725)	0.478 (0.373)	-4.175** (1.634)	-0.445 (0.439)	-9.661*** (2.535)	-0.795 (0.518)
Doing Business	Proc. Getting Elec.	-1.122*** (0.209)	-1.053*** (0.207)	-0.970*** (0.117)	-0.844*** (0.135)	-1.125*** (0.226)	-0.872*** (0.247)	-1.162*** (0.197)	-0.797*** (0.172)
	Time Getting Elec.	0.0634*** (0.0194)	0.0695*** (0.0198)	0.0372* (0.0196)	0.0477** (0.0199)	0.0508** (0.0205)	0.0693*** (0.0202)	0.0304 (0.0194)	0.0494*** (0.0156)
2-Labor									
Perception	Labor	-1.205** (0.535)	0.403 (0.432)	-1.184 (1.012)	0.0939 (0.449)	-3.575* (1.953)	-0.234 (0.508)	-15.51*** (5.804)	-0.965 (0.625)
3-Finance									
Factual	Self finan.	-0.531 (0.348)	0.101 (0.370)	-0.0682 (0.468)	0.863* (0.474)	0.569 (0.510)	2.350*** (0.558)	0.132 (0.565)	2.568*** (0.646)
	Bank finan.	0.161 (0.635)	-1.705*** (0.620)	-0.198 (1.159)	-1.721** (0.751)	-6.759*** (1.980)	-1.548 (0.973)	-5.721*** (2.207)	-2.035* (1.176)
	Account share	0.478 (0.305)	0.828** (0.323)	0.320 (0.439)	0.980** (0.422)	-0.491 (0.437)	0.660 (0.543)	-0.236 (0.505)	1.022* (0.595)
Perception									
Doing Business	Credit regis. Cov	0.0387*** (0.0115)	0.0506*** (0.0113)	0.0279*** (0.00734)	0.0424*** (0.00689)	0.0189 (0.0171)	0.0450*** (0.00691)	0.0291*** (0.00785)	0.0343*** (0.00550)
	Credit bureau cov	-0.0791*** (0.0105)	-0.0539*** (0.00856)	-0.0784*** (0.00503)	-0.0361*** (0.00770)	-0.0683*** (0.0209)	-0.0307* (0.0166)	-0.128*** (0.0130)	-0.0184** (0.00747)
4-Fiscal									
Doing Business	Number of pay.	-0.0641*** (0.00589)	-0.0466*** (0.00804)	-0.0551*** (0.0109)	-0.0285*** (0.00862)	-0.0892*** (0.0113)	-0.0377*** (0.00758)	-0.102*** (0.0219)	-0.0236*** (0.00492)
	Time to pay tax	-0.00547*** (0.000481)	-0.00404*** (0.000404)	-0.00462*** (0.000995)	-0.00246*** (0.000563)	-0.00756*** (0.00122)	-0.00300*** (0.000768)	-0.00958*** (0.00191)	-0.00206*** (0.000534)
	Total tax rate	0.0198	0.0277	0.0161	0.0285	0.0295*	0.0494***	0.0193	0.0383***

		(0.0298)	(0.0290)	(0.0214)	(0.0204)	(0.0159)	(0.0150)	(0.0148)	(0.0110)
		<i>5-Enforcing</i>							
Doing Business	Proc. Enf. Contracts	-0.337*** (0.0491)	-0.329*** (0.0485)	-0.200*** (0.0541)	-0.187*** (0.0506)	-0.313*** (0.0763)	-0.277*** (0.0749)	-0.235*** (0.0485)	-0.195*** (0.0520)
	Time Enf. Contracts	-0.00199*** (0.000634)	-0.00142** (0.000687)	-0.00149** (0.000702)	-0.000702 (0.000657)	-0.00330*** (0.000425)	-0.00124** (0.000612)	-0.00283*** (0.000338)	-0.000650 (0.000507)
	Cost Res. Insolvency	-0.0975*** (0.0132)	-0.0782*** (0.0140)	-0.0842*** (0.00592)	-0.0517*** (0.00776)	-0.107*** (0.0161)	-0.0543*** (0.0133)	-0.132*** (0.0224)	-0.0385*** (0.00798)

Source: Authors' own elaboration based on STATA output.

Notes: (i) *Small* stands for firms whose size is less or equal to the median and *Large* for those whose size is greater than the median.

(ii) Each line represents an individual regression. Robust standard errors in parentheses.

(iii) *** p<0.01, ** p<0.05, * p<0.1.

(iv) All regressions include country, sector and year dummies.

Table 8. Summary of Results – By firm size (probit model) continued

		Two way		GVC cert.		GVC for.		GVC all	
		Small	Large	Small	Large	Small	Large	Small	Large
6- Permits									
Doing Business	Time cons perm.	-0.00790*	-0.00502	-0.00757**	-0.00277	-0.0155***	-0.00535*	-0.0136***	-0.00242
		(0.00439)	(0.00430)	(0.00337)	(0.00328)	(0.00385)	(0.00309)	(0.00261)	(0.00238)
	Cost cons perm.	0.190***	0.215***	0.128***	0.165***	0.0876	0.187***	0.0722	0.147***
		(0.0512)	(0.0621)	(0.0310)	(0.0585)	(0.0635)	(0.0697)	(0.0522)	(0.0559)
	Proc regis prop.	-0.267***	-0.224***	-0.267***	-0.183***	-0.276***	-0.149**	-0.411***	-0.137***
	(0.0662)	(0.0604)	(0.0231)	(0.0377)	(0.0831)	(0.0759)	(0.0557)	(0.0387)	
	Time regis prop.	-0.0232***	-0.0187***	-0.0209***	-0.0123***	-0.0222***	-0.0101*	-0.0281***	-0.00729**
		(0.00337)	(0.00356)	(0.00354)	(0.00336)	(0.00700)	(0.00550)	(0.00618)	(0.00365)
	Cost regis prop.	0.173***	0.146***	0.0841	0.100**	0.107***	0.154***	0.0471	0.101***
		(0.0351)	(0.0475)	(0.0552)	(0.0449)	(0.0406)	(0.0433)	(0.0664)	(0.0316)
7- Informality									
Factual	Informality	-0.204	0.0120	-1.389***	-0.440	-2.261***	-0.954**	-1.931***	-0.925*
		(0.239)	(0.263)	(0.509)	(0.303)	(0.539)	(0.417)	(0.611)	(0.494)
Perception	Informality	-0.411	-0.164	-1.555***	-0.462	-2.378***	-0.241	-2.216**	-0.285
		(0.275)	(0.304)	(0.600)	(0.298)	(0.816)	(0.349)	(1.041)	(0.441)
8- Trade procedures									
Doing Business	Doc to exp.	-0.297***	-0.245***	-0.200***	-0.122**	-0.482***	-0.204***	-0.507***	-0.131***
		(0.0444)	(0.0408)	(0.0732)	(0.0500)	(0.0593)	(0.0459)	(0.0470)	(0.0328)
	Doc to imp.	-0.234***	-0.192***	-0.144*	-0.0836	-0.396***	-0.172***	-0.354***	-0.0978*
		(0.0621)	(0.0636)	(0.0746)	(0.0644)	(0.0506)	(0.0632)	(0.0275)	(0.0512)
	Cost to exp.	0.00237	0.00264	0.00197**	0.00248***	0.000115	0.00167	0.000599	0.00202**
		(0.00164)	(0.00165)	(0.000808)	(0.000778)	(0.00187)	(0.00150)	(0.00112)	(0.000819)
	Cost to imp.	0.00181***	0.00207***	0.000765*	0.00120***	0.000107	0.00118**	-0.000369	0.000865***
		(0.000514)	(0.000500)	(0.000419)	(0.000312)	(0.000472)	(0.000509)	(0.000254)	(0.000326)
	Time to exp.	0.127***	0.148***	0.0712*	0.109***	0.00173	0.0956	-0.00822	0.0869*
		(0.0429)	(0.0432)	(0.0423)	(0.0405)	(0.0674)	(0.0595)	(0.0543)	(0.0481)
	Time to imp.	0.0909**	0.108***	0.0448	0.0756**	0.0149	0.0846	-0.00580	0.0665*
		(0.0358)	(0.0363)	(0.0305)	(0.0303)	(0.0506)	(0.0520)	(0.0444)	(0.0397)
9-Security									
Factual	Theft	-0.0399	-0.0113	-0.00450	-0.0169	-1.505**	-0.175*	-5.455***	-0.197*
		(0.0403)	(0.0358)	(0.0474)	(0.0553)	(0.737)	(0.0988)	(2.115)	(0.110)

	Break	-0.234*** (0.0768)	-0.0744*** (0.0276)	-0.246** (0.120)	-0.0449 (0.0293)				
Doing Business	Protec Inv. (Liability)	0.178* (0.0928)	0.243*** (0.0745)	0.142*** (0.0394)	0.225*** (0.0381)	0.0923 (0.113)	0.251*** (0.0484)	0.116** (0.0526)	0.214*** (0.0393)

Source: Authors' own elaboration based on STATA output.

Notes: (i) *Small* stands for firms whose size is less or equal to the median and *Large* for those whose size is greater than the median.

(ii) Each line represents an individual regression. Robust standard errors in parentheses.

(iii) *** p<0.01, ** p<0.05, * p<0.1.

(iv) All regressions include country, sector and year dummies.

Table 9. Summary of Results – By firm age (probit model)

		Two way		GVC cert.		GVC for.		GVC all	
		New	Old	New	Old	New	Old	New	Old
1-Infrastructure									
	Generator	0.811*** (0.312)	1.457*** (0.375)	1.049*** (0.356)	1.506*** (0.513)	0.211 (0.371)	1.017 (0.631)	0.0368 (0.410)	0.894 (0.691)
	Telecom	0.550 (0.353)	0.479 (0.395)	0.935* (0.478)	0.714 (0.452)	0.736 (0.516)	-0.848 (0.658)	1.094** (0.540)	-1.465* (0.836)
	Transport	-0.187 (0.363)	-0.0246 (0.331)	0.279 (0.405)	-0.0564 (0.424)	-0.864* (0.520)	-1.050* (0.616)	-0.920 (0.595)	-1.645** (0.746)
Doing Business	Proc. Getting Elec.	-1.113*** (0.202)	-1.055*** (0.199)	-0.898*** (0.119)	-0.901*** (0.122)	-0.923*** (0.210)	-0.956*** (0.162)	-0.823*** (0.158)	-0.844*** (0.124)
	Time Getting Elec.	0.0621*** (0.0193)	0.0664*** (0.0195)	0.0423** (0.0187)	0.0428** (0.0195)	0.0589*** (0.0203)	0.0557*** (0.0203)	0.0406** (0.0162)	0.0389** (0.0164)
2-Labor									
Perception	Labor	-1.017** (0.454)	0.282 (0.404)	-0.407 (0.499)	-0.0762 (0.564)	-0.765 (0.566)	-0.812 (0.612)	-1.281* (0.745)	-1.428* (0.741)
3-Finance									
Factual	Self finan.	-0.296 (0.362)	-0.0168 (0.350)	0.649 (0.466)	0.645 (0.471)	1.721*** (0.529)	1.810*** (0.532)	1.856*** (0.623)	1.928*** (0.621)
	Bank finan.	-1.095 (0.741)	-0.256 (0.631)	-0.760 (0.972)	-1.422 (0.896)	-2.252** (0.906)	-2.582* (1.442)	-2.600** (1.056)	-2.772* (1.605)
	Account share	0.508* (0.307)	0.738** (0.313)	0.747* (0.432)	0.822* (0.455)	0.210 (0.570)	0.169 (0.600)	0.718 (0.682)	0.725 (0.727)
Doing Business	Credit regis. Cov	0.0399*** (0.0126)	0.0472*** (0.00977)	0.0345*** (0.00716)	0.0384*** (0.00417)	0.0338** (0.0162)	0.0335*** (0.00754)	0.0303*** (0.00816)	0.0339*** (0.00872)
	Credit bureau cov	-0.0763*** (0.00973)	-0.0624*** (0.00904)	-0.0510*** (0.00567)	-0.0556*** (0.00609)	-0.0461** (0.0198)	-0.0474*** (0.00981)	-0.0409*** (0.0113)	-0.0446*** (0.00922)
4-Fiscal									
Doing Business	Number of pay.	-0.0608*** (0.00723)	-0.0483*** (0.00823)	-0.0367*** (0.0106)	-0.0375*** (0.0100)	-0.0526*** (0.00627)	-0.0480*** (0.00388)	-0.0377*** (0.00621)	-0.0347*** (0.00713)
	Time to pay tax	-0.00516*** (0.000461)	-0.00424*** (0.000469)	-0.00307*** (0.000741)	-0.00311*** (0.000697)	-0.00397*** (0.000649)	-0.00363*** (0.000796)	-0.00282*** (0.000561)	-0.00258*** (0.000776)
	Total tax rate	0.0196 (0.0300)	0.0253 (0.0290)	0.0238 (0.0203)	0.0246 (0.0203)	0.0426*** (0.0144)	0.0384** (0.0154)	0.0319*** (0.0118)	0.0297** (0.0123)
5-Enforcing									
Doing Business	Proc. Enf. Contracts	-0.331*** (0.0478)	-0.325*** (0.0481)	-0.187*** (0.0520)	-0.187*** (0.0503)	-0.255*** (0.0722)	-0.262*** (0.0740)	-0.175*** (0.0536)	-0.179*** (0.0558)

Time Enf. Contracts	-0.00182*** (0.000671)	-0.00143** (0.000724)	-0.000897 (0.000708)	-0.000863 (0.000692)	-0.00156*** (0.000530)	-0.00136** (0.000584)	-0.000919* (0.000550)	-0.000759 (0.000592)
Cost Res. Insolvency	-0.0954*** (0.0127)	-0.0809*** (0.0130)	-0.0634*** (0.00427)	-0.0653*** (0.00379)	-0.0719*** (0.0140)	-0.0729*** (0.00405)	-0.0585*** (0.00962)	-0.0600*** (0.00489)

Source: Authors' own elaboration based on STATA output.

Notes: (i) *New* stands for firms whose age is less or equal to the median and *Old* for those whose age is greater than the median.

(ii) Each line represents an individual regression. Robust standard errors in parentheses.

(iii) *** p<0.01, ** p<0.05, * p<0.1.

(iv) All regressions include country, sector and year dummies.

Table 10. Summary of Results – By firm age (probit model) continued

		Two way		GVC cert.		GVC for.		GVC all	
		New	Old	New	Old	New	Old	New	Old
6- Permits									
Doing Business	Time cons perm.	-0.00757*	-0.00503	-0.00415	-0.00375	-0.00787***	-0.00646**	-0.00459*	-0.00347
		(0.00409)	(0.00447)	(0.00344)	(0.00351)	(0.00266)	(0.00297)	(0.00247)	(0.00280)
	Cost cons perm.	0.183***	0.214***	0.141***	0.153***	0.152**	0.116*	0.125**	0.108**
		(0.0484)	(0.0602)	(0.0398)	(0.0516)	(0.0667)	(0.0653)	(0.0494)	(0.0506)
	Proc regis prop.	-0.267***	-0.229***	-0.214***	-0.217***	-0.187**	-0.209***	-0.182***	-0.200***
	(0.0621)	(0.0600)	(0.0298)	(0.0286)	(0.0772)	(0.0453)	(0.0486)	(0.0191)	
	Time regis prop.	-0.0231***	-0.0191***	-0.0154***	-0.0153***	-0.0142***	-0.0150***	-0.0119***	-0.0124***
		(0.00345)	(0.00319)	(0.00312)	(0.00318)	(0.00546)	(0.00509)	(0.00370)	(0.00437)
	Cost regis prop.	0.170***	0.154***	0.0928***	0.0925*	0.164***	0.0662	0.110***	0.0375
		(0.0342)	(0.0447)	(0.0353)	(0.0552)	(0.0355)	(0.0613)	(0.0275)	(0.0646)
7- Informality									
Factual	Informality	-0.204	0.0120	-1.389***	-0.440	-2.261***	-0.954**	-1.931***	-0.925*
		(0.239)	(0.263)	(0.509)	(0.303)	(0.539)	(0.417)	(0.611)	(0.494)
Perception	Informality	-0.411	-0.164	-1.555***	-0.462	-2.378***	-0.241	-2.216**	-0.285
		(0.275)	(0.304)	(0.600)	(0.298)	(0.816)	(0.349)	(1.041)	(0.441)
8- Trade procedures									
Doing Business	Doc to exp.	-0.290***	-0.241***	-0.148**	-0.140***	-0.228***	-0.237***	-0.149***	-0.151***
		(0.0436)	(0.0456)	(0.0605)	(0.0537)	(0.0408)	(0.0602)	(0.0431)	(0.0567)
	Doc to imp.	-0.226***	-0.186***	-0.103	-0.0935	-0.186***	-0.188***	-0.110*	-0.106*
		(0.0635)	(0.0688)	(0.0704)	(0.0662)	(0.0562)	(0.0652)	(0.0578)	(0.0636)
	Cost to exp.	0.00228	0.00272*	0.00227***	0.00233***	0.00115	0.00105	0.00169**	0.00162**
		(0.00165)	(0.00155)	(0.000728)	(0.000756)	(0.00146)	(0.00137)	(0.000781)	(0.000687)
	Cost to imp.	0.00175***	0.00202***	0.000962**	0.000988***	0.000691	0.000465	0.000543*	0.000381
		(0.000492)	(0.000505)	(0.000397)	(0.000299)	(0.000430)	(0.000504)	(0.000304)	(0.000327)
	Time to exp.	0.120***	0.145***	0.0870**	0.0915**	0.0634	0.0522	0.0645	0.0569
		(0.0426)	(0.0430)	(0.0398)	(0.0382)	(0.0513)	(0.0461)	(0.0434)	(0.0350)
	Time to imp.	0.0853**	0.104***	0.0575**	0.0606**	0.0576	0.0465	0.0479	0.0403
		(0.0345)	(0.0363)	(0.0278)	(0.0272)	(0.0432)	(0.0385)	(0.0335)	(0.0267)
9-Security									
Factual	Theft	-0.0646	0.00145	0.0138	-0.0865	-0.211**	-0.242*	-0.201*	-0.272*
		(0.0506)	(0.0160)	(0.0364)	(0.0820)	(0.0994)	(0.140)	(0.106)	(0.142)
	Break	-0.140***	-0.0762*	-0.0782**	-0.0762	-0.0567	-0.0994	-0.0299	-0.116
		(0.0343)	(0.0430)	(0.0376)	(0.0502)	(0.0451)	(0.0769)	(0.0470)	(0.0849)
Doing	Protec Inv. (Liability)	0.179*	0.231***	0.192***	0.197***	0.200**	0.174***	0.184***	0.174***

Business (0.0940) (0.0766) (0.0381) (0.0358) (0.0778) (0.0613) (0.0326) (0.0453)

Source: Authors' own elaboration based on STATA output.

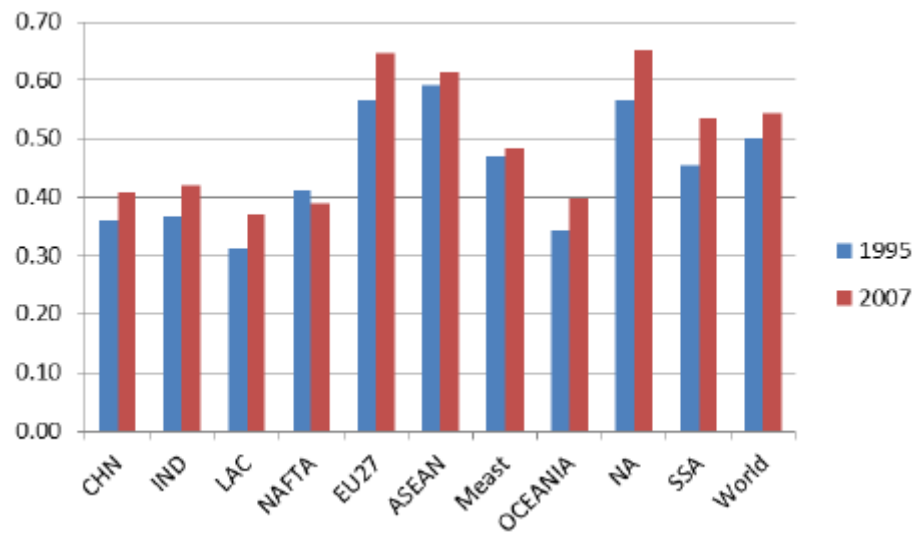
Notes: (i) *New* stands for firms whose age is less or equal to the median and *Old* for those whose age is greater than the median.

(ii) Each line represents an individual regression. Robust standard errors in parentheses.

(iii) *** p<0.01, ** p<0.05, * p<0.1.

(iv) All regressions include country, sector and year dummies.

Figure 1. GVC participation (by region)



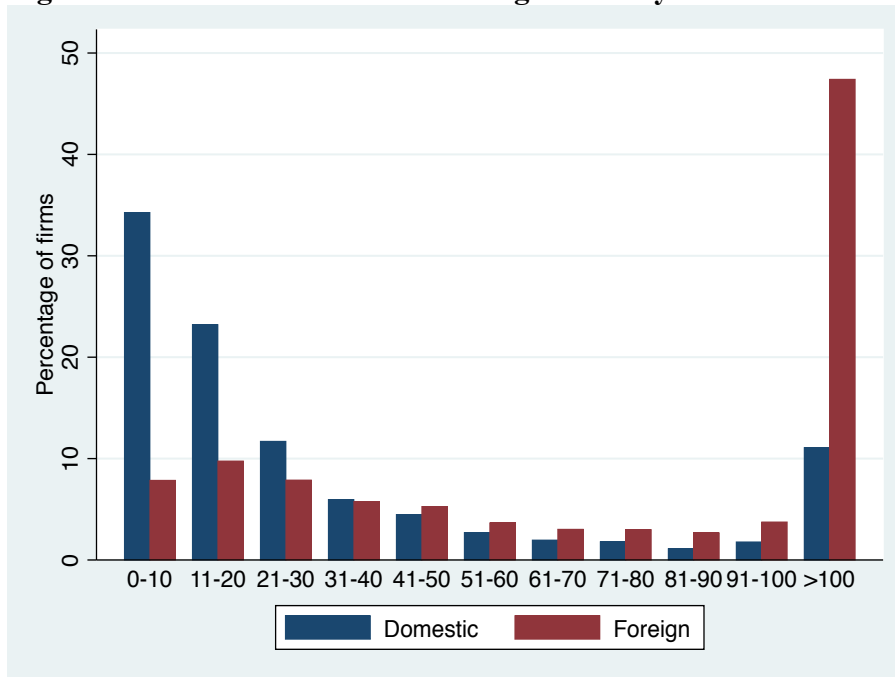
Source: Del Prete et al (2015).

Figure 2. GVC definitions

Definition 1	Definition 2	Definition 3	Definition 4
=	=	=	=
Exporter	Exporter	Exporter	Exporter
+	+	+	+
Importer	Importer	Importer	Importer
	+	+	+
	Certification	Foreign Capital	Foreign Capital
			+
			Certification

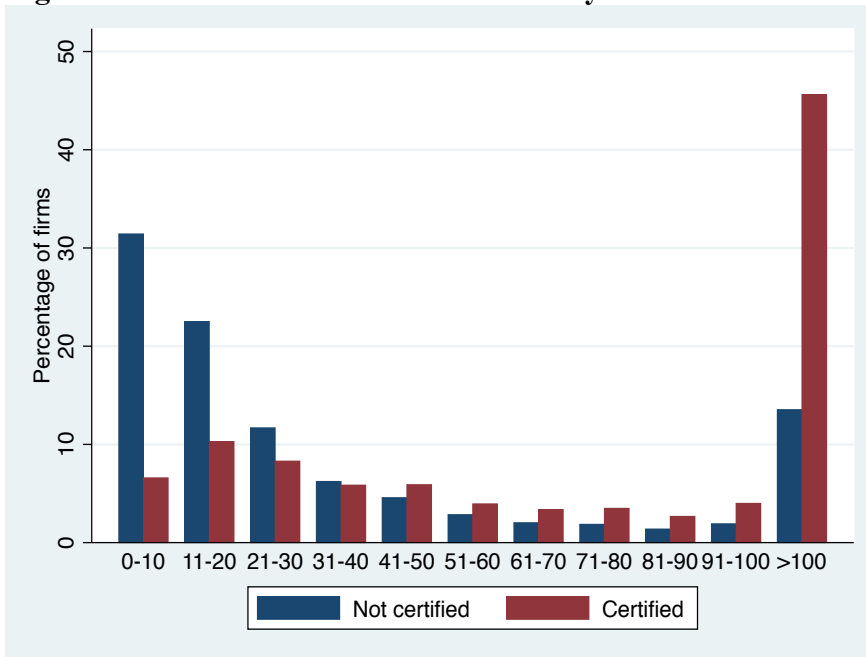
Source: Authors' own elaboration.

Figure 3. Share of domestic and foreign firms by size



Source: Authors' own elaboration using the WBES dataset.

Figure 4. Certified vs. not certified firms by size



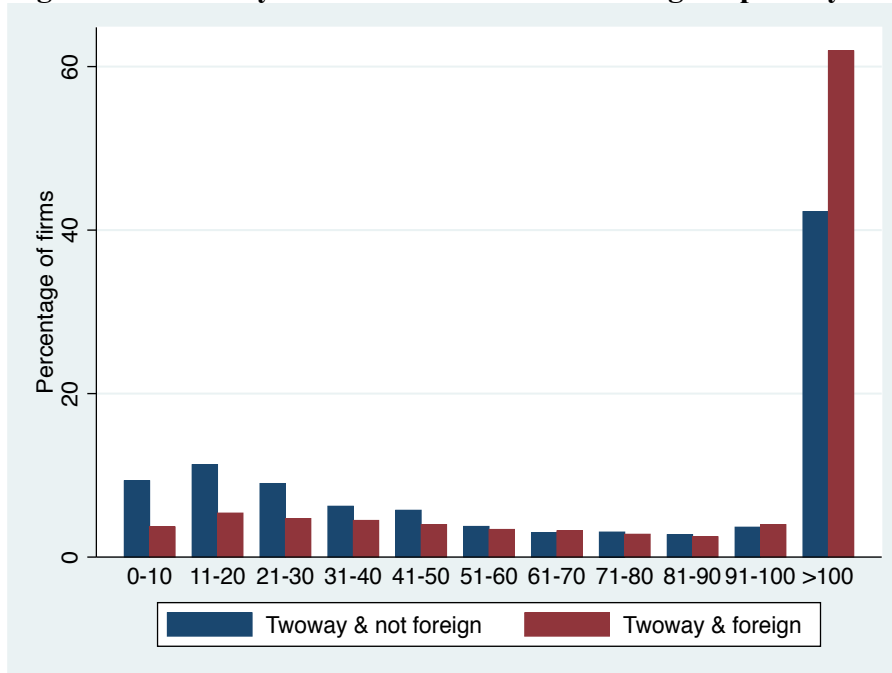
Source: Authors' own elaboration using the WBES dataset.

Figure 5. Two-Ways Firms: certified vs. not certified by size



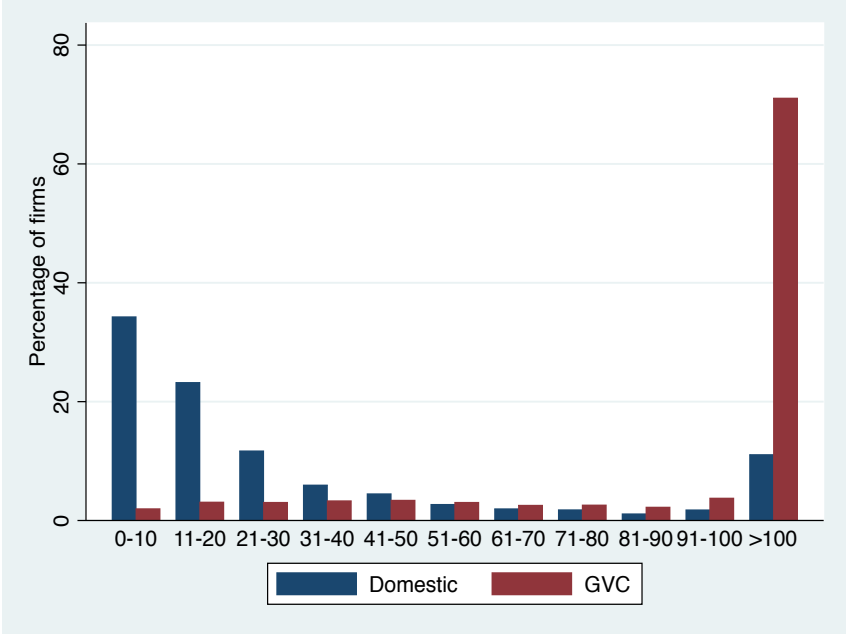
Source: Authors' own elaboration using the WBES dataset.

Figure 6. Two-Ways Firms with or without foreign capital by size



Source: Authors' own elaboration using the WBES dataset.

Figure 7. Domestic vs. GVC firms by size



Source: Authors' own elaboration using the WBES dataset.

Appendix 1

Variables definition

Table A1. Variables definitions and sources

	Name	Definition	Source
1-Infrastructure			
Factual	Power Outage	Percentage of firms declaring power outages by country, industry, region and year	WBES
	Generator	Percentage of firms declaring having a generator by country, industry, region and year	WBES
	Water	Percentage of firms declaring having access to water by country, industry, region and year	WBES
Perceptions	Electricity	Average % of firms declaring as a major or a severe obstacle by country, industry, region and year	WBES
	Telecom	Average % of firms declaring telecommunications as a major or a severe obstacle country, industry, region and year	WBES
	Transport	Average % of firms declaring transport as a major or a severe obstacle by country, industry, region and year	WBES
Doing Business	Proc. Getting Elec.	Getting Electricity - Procedures (number) (log).	DB
	Time Getting Elec.	Getting Electricity - Time (days) (log).	DB
	Cost Getting Elec.	Getting Electricity - Cost (% of income per capita).	DB
2-Labor			
Perception	Labor	Average % of firms declaring labor regulations as a major or a severe obstacle by country, industry, region and year.	WBES
	Education	Average % of firms declaring education as a major or a severe obstacle by country, industry, region and year.	WBES
3-Finance			
Factual	Self finan.	Whether the firm is self-financing its investments.	WBES
	Self finan. Share	The share of self-financing.	WBES
	Bank finan.	Whether the firm is financing its investments through banks.	WBES
	Bank finan. Share	The share of banking financing.	WBES
	Account share	Average % of firms declaring a checking and/or a saving account by country, industry, region and year.	WBES
	Overdraft fac.		WBES
	Credit loan	Average % of firms with a line of credit or a loan from a financial institution by country, industry, region and year.	WBES
Perception	Finance	Average % of firms declaring access to finance as a major or a severe obstacle by country, industry, region and year.	WBES
Doing Business	Credit regis. Cov	Getting Credit - Credit registry coverage (% of adults) .	DB
	Credit bureau cov	Getting Credit - Credit bureau coverage (% of adults).	DB
4-Fiscal			
Perceptions	Tax rate	Average % of firms declaring tax rates as a major or a severe obstacle by country, industry, region and year.	WBES
	Tax admin.	Average % of firms declaring tax administration as a major or a severe obstacle by country, industry, region and year.	WBES
Doing Business	Number of pay.	Paying Taxes - Payments (number per year - log).	DB
	Time to pay tax	Paying Taxes - Time (hours per year) (log).	DB
	Total tax rate	Paying Taxes - Total tax rate (% of profit).	DB
	Profit tax	Paying Taxes - Profit tax (% of profit).	DB
	Labor tax and cont	Paying Taxes - Labor tax and contributions (% of profit).	DB
5-Enforcing			
Doing Business	Proc. Enf. Contracts	Enforcing Contracts - Procedures (number) (log).	DB
	Time Enf. Contracts	Enforcing Contracts - Time (days) (log).	DB
	Cost Enf. Contracts	Enforcing Contracts - Cost (% of claim).	DB
	Time Res. Insolvency	Resolving Insolvency - Time (years) (log).	DB
	Cost Res. Insolvency	Resolving Insolvency - Cost (% of estate)	DB
6- Permits			

Perception	Permits	Average % of firms declaring permits as a major or a severe obstacle	WBES
	Proc Start bus.	Starting a Business - Procedures - Men (number, log).	DB
	Time start bus.	Starting a Business - Time - Men (days, log).	DB
	Cost start bus.	Starting a Business - Cost - Men (% of income per capita).	DB
Doing Business	Proc cons perm.	Dealing with Construction Permits - Procedures (number, log).	DB
	Time cons perm.	Dealing with Construction Permits - Time (days, log).	DB
	Cost cons perm.	Dealing with Construction Permits - Cost (% of Warehouse value).	DB
	Proc regis prop.	Registering Property - Procedures (number, log).	DB
	Time regis prop.	Registering Property - Time (days, log)	DB
	Cost regis prop.	Registering Property - Cost (% of property value).	DB
7- Informality			
Factual	Informality	Average % of firms competing against informal firms by country, industry, region and year	WBES
	Sales inf. Pay.	Average % of total sales paid in informal payments by country, industry, region and year	WBES
Perception	Informality	Average % of firms competing against informal firms by country, industry, region and year	WBES
8- Trade procedures			
Perception	Trade obs.	Average % of firms declaring customs and trade regulations as a major or a severe obstacle	WBES
	Doc to exp.	Trading across Borders - Documents to export (number) (log).	DB
	Doc to imp.	Trading across Borders - Documents to import (number) (log).	DB
Doing Business	Cost to exp.	Trading across Borders - Cost to export (US\$ per container deflated) (log)	DB
	Cost to imp.	Trading across Borders - Cost to import (US\$ per container deflated) (log).	DB
	Time to exp.	Trading across Borders - Time to export (days) (log).	DB
	Time to imp.	Trading across Borders - Time to import (days) (log).	DB
9- Security			
Factual	Theft	Average % of value of products lost in transit due to theft by country, industry, region and year	WBES
	Break	Average % of value of products lost in transit due to breakage or spoilage by country, industry, region and year	WBES
	Courts	Average % of firms declaring courts as a major or a severe obstacle by country, industry, region and year	WBES
Perception	Crime	Average % of firms declaring crime, theft or disorder as a major or a severe obstacle by country, industry, region and year	WBES
	Political stab.	Average % of firms declaring political stability as a major or a severe obstacle	WBES
	Corruption	Average % of firms declaring corruption as a major or a severe obstacle by country, industry, region and year	WBES
Doing Business	Protec Inv. (Disclosure)	Protecting Minority Investors - Extent of disclosure index (0-10)	DB
	Protec Inv. (Liability)	Protecting Minority Investors - Extent of director liability index (0-10)	DB

Appendix 2

Regression results

Table A2. Effect of Infrastructure on GVC

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Factual	Power Outage	0.0575 (0.0458)	0.0459 (0.0318)	0.0342 (0.0259)	0.0425* (0.0236)
	Generator	0.184*** (0.0614)	0.115** (0.0457)	0.0237 (0.0248)	0.0120 (0.0232)
	Water	0.0297 (0.0329)	0.0132 (0.0254)	0.00986 (0.0171)	0.00875 (0.0169)
Perceptions	Electricity	0.0598 (0.0405)	0.0598** (0.0270)	0.00564 (0.0190)	0.0143 (0.0177)
	Telecom	0.107* (0.0615)	0.0889* (0.0489)	0.0215 (0.0389)	0.0224 (0.0374)
	Transport	-0.0107 (0.0452)	0.0100 (0.0335)	-0.0332* (0.0180)	-0.0298* (0.0160)
Doing Business	Proc. Getting Elec.	-1.393*** (0.139)	-0.454*** (0.0270)	-0.440*** (0.0337)	-0.204*** (0.00657)
	Time Getting Elec.	0.925* (0.336)	0.179 (0.150)	0.225 (0.127)	0.0847 (0.0634)
	Cost Getting Elec.	3.09e-05 (3.67e-05)	-1.13e-05 (9.81e-06)	1.39e-05 (9.31e-06)	6.68e-07 (4.14e-06)
		4,072	4,072	4,072	4,072

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A3. Effect of Infrastructure on GVC (by size)

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Factual	Power Outage*Size1	0.0469 (0.0436)	0.0413 (0.0269)	0.0250 (0.0220)	0.0307 (0.0191)
	Power Outage*Size2	0.0868 (0.0653)	0.0590 (0.0500)	0.0577 (0.0380)	0.0717** (0.0361)
	Generator*Size1	0.0928 (0.0593)	0.0229 (0.0391)	0.000532 (0.0170)	-0.0114 (0.0152)
	Generator*Size2	0.410*** (0.109)	0.343*** (0.0937)	0.0837 (0.0598)	0.0705 (0.0579)
	Water*Size1	-0.00565 (0.0268)	-0.00645 (0.0187)	0.00236 (0.00986)	-0.00210 (0.00904)
	Water*Size2	0.162* (0.0917)	0.0810 (0.0735)	0.0436 (0.0574)	0.0503 (0.0575)
	Perception	Electricity*Size1	0.0345 (0.0377)	0.0289 (0.0191)	-0.00214 (0.0132)
Electricity*Size2		0.131* (0.0774)	0.145** (0.0574)	0.0300 (0.0411)	0.0474 (0.0397)
Telecom*Size1		0.0120 (0.0497)	0.000843 (0.0263)	-0.0186 (0.0144)	-0.0126 (0.0109)
Telecom*Size2		0.358** (0.141)	0.320*** (0.124)	0.131 (0.115)	0.115 (0.114)
Transp.*Size1		-0.0485 (0.0431)	-0.0207 (0.0240)	-0.0241 (0.0168)	-0.0235 (0.0148)
Transp.*Size2		0.100 (0.103)	0.0971 (0.0883)	-0.0561* (0.0336)	-0.0491* (0.0273)
Doing Business		Proc. Getting Elec.*Size1	-0.313*** (0.0318)	-0.104*** (0.00568)	-0.0992*** (0.00738)
	Proc. Getting Elec.*Size2	-0.299*** (0.0323)	-0.0929*** (0.00721)	-0.0942*** (0.0102)	-0.0416*** (0.00376)
	Time Getting Elec.*Size1	0.0151** (0.00526)	0.00278 (0.00224)	0.00353 (0.00212)	0.00126 (0.00100)
	Time Getting Elec.*Size2	0.0166** (0.00542)	0.00385 (0.00246)	0.00417 (0.00219)	0.00176 (0.00101)
	Cost Getting Elec.*Size1	2.16e-05 (3.05e-05)	-1.55e-05 (9.43e-06)	5.10e-06 (5.15e-06)	-7.68e-06** (2.74e-06)
	Cost Getting Elec.*Size2	4.56e-05 (5.08e-05)	-3.84e-06 (1.87e-05)	2.88e-05 (1.69e-05)	1.48e-05* (6.22e-06)
			4,209	4,179	4,181

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A4. Effect of Infrastructure on GVC (by age)

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Factual	Power Outage*Age1	0.0360 (0.0476)	0.0439 (0.0337)	0.0361 (0.0286)	0.0456* (0.0264)
	Power Outage*Age2	0.0883* (0.0506)	0.0487 (0.0328)	0.0316 (0.0230)	0.0382* (0.0205)
	Generator*Age1	0.125** (0.0603)	0.0774** (0.0377)	0.0130 (0.0195)	-0.00146 (0.0169)
	Generator*Age2	0.305*** (0.0914)	0.191** (0.0782)	0.0458 (0.0458)	0.0397 (0.0448)
	Water*Age1	0.0133 (0.0381)	0.0119 (0.0291)	0.0142 (0.0207)	0.0139 (0.0206)
	Water*Age2	0.0725 (0.0442)	0.0165 (0.0272)	-0.00155 (0.0135)	-0.00476 (0.0125)
	Perception	Electricity*Age1	0.0374 (0.0431)	0.0522* (0.0305)	0.00626 (0.0227)
Electricity*Age2		0.0920* (0.0498)	0.0706** (0.0277)	0.00473 (0.0160)	0.0106 (0.0148)
Telecom*Age1		0.103 (0.0769)	0.0850 (0.0648)	0.0570 (0.0567)	0.0555 (0.0547)
Telecom*Age2		0.114 (0.0889)	0.0953* (0.0565)	-0.0365 (0.0238)	-0.0318 (0.0202)
Transp.*Age1		-0.0174 (0.0518)	0.0170 (0.0367)	-0.0277 (0.0203)	-0.0225 (0.0180)
Transp.*Age2		0.00235 (0.0634)	-0.00360 (0.0503)	-0.0440* (0.0229)	-0.0441** (0.0203)
Doing Business		Proc. Getting Elec.*Age1	-0.311*** (0.0305)	-0.101*** (0.00604)	-0.0980*** (0.00770)
	Proc. Getting Elec.*Age2	-0.302*** (0.0314)	-0.101*** (0.00660)	-0.0997*** (0.00514)	-0.0458*** (0.000776)
	Time Getting Elec.*Age1	0.0150* (0.00540)	0.00297 (0.00234)	0.00389 (0.00230)	0.00145 (0.00107)
	Time Getting Elec.*Age2	0.0157** (0.00543)	0.00309 (0.00244)	0.00366 (0.00220)	0.00140 (0.00106)
	Cost Getting Elec.*Age1	2.82e-05 (2.57e-05)	-1.15e-05 (5.92e-06)	3.34e-05** (9.06e-06)	9.23e-06** (2.86e-06)
	Cost Getting Elec.*Age2	3.34e-05 (4.84e-05)	-1.10e-05 (1.51e-05)	-4.25e-06 (1.18e-05)	-7.27e-06 (6.39e-06)
	Obs.	4.247	4.217	4.219	4.197

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A5. Effect of Labor and Education on GVC (by size and by age)

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Perception	Labor	-0.0457 (0.0411)	-0.0141 (0.0305)	-0.0229 (0.0142)	-0.0261** (0.0127)
	Education	0.0795* (0.0462)	0.0125 (0.0272)	0.0284 (0.0252)	0.0111 (0.0211)
With size	Labor*Size1	-0.0958** (0.0383)	-0.0389 (0.0251)	-0.0154 (0.0113)	-0.0182* (0.00975)
	Labor*Size2	0.0972 (0.110)	0.0513 (0.0848)	-0.0396 (0.0361)	-0.0496 (0.0321)
	Education*Size1	0.0294 (0.0467)	-0.0173 (0.0233)	0.00286 (0.0223)	-0.00159 (0.0170)
	Education*Size2	0.230** (0.103)	0.102 (0.0724)	0.107* (0.0607)	0.0481 (0.0555)
With age	Labor*Age1	-0.0933** (0.0464)	-0.0210 (0.0350)	-0.0168 (0.0166)	-0.0212 (0.0146)
	Labor*Age2	0.0317 (0.0674)	-0.00294 (0.0472)	-0.0328 (0.0205)	-0.0339* (0.0189)
	Education*Age1	0.0200 (0.0534)	-0.0341 (0.0276)	0.0308 (0.0286)	-0.00353 (0.0206)
	Education*Age2	0.171** (0.0689)	0.0841* (0.0452)	0.0247 (0.0364)	0.0336 (0.0342)
Obs.	4,072	4,072	4,072	4,072	

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A6. Effect of Finance on GVC

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Factual	Self finan.	-0.0176 (0.0659)	0.0522 (0.0444)	0.0914*** (0.0348)	0.0687** (0.0323)
	Self finan. Share	0.0442 (0.104)	0.0435 (0.0722)	0.102*** (0.0314)	0.0685** (0.0291)
	Bank finan.	-0.160 (0.118)	-0.158* (0.0900)	-0.167** (0.0714)	-0.134** (0.0674)
	Bank finan. Share	-0.0795 (0.0542)	-0.0791** (0.0388)	-0.0770** (0.0350)	-0.0607* (0.0324)
	Account share	0.0474 (0.0347)	0.0291 (0.0230)	-0.00687 (0.0125)	0.00593 (0.0115)
	Overdraft fac.	-0.0492 (0.0455)	-0.0147 (0.0254)	-0.0230 (0.0161)	-0.0124 (0.0144)
	Credit loan	-0.0244 (0.0543)	-0.00951 (0.0455)	-0.0525 (0.0405)	-0.0419 (0.0393)
	Perception	Finance	0.0438 (0.0389)	0.00347 (0.0230)	-0.0120 (0.0155)
Doing Business	Credit regis. Cov	0.0119*** (0.00213)	0.00416*** (0.000213)	0.00333** (0.000877)	0.00168*** (0.000234)
	Credit bureau cov	-0.0174*** (0.00220)	-0.00492** (0.00118)	-0.00364 (0.00176)	-0.00177* (0.000758)
Obs.		4,072	4,072	4,072	4,072

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A7. Effect of Finance on GVC (by size)

		OLS				
		Two way	GVC cert.	GVC for.	GVC all	
Factual	Self finan.*Size1	-0.0550 (0.0640)	0.0265 (0.0411)	0.0782** (0.0315)	0.0571** (0.0287)	
	Self finan.*Size2	0.0544 (0.0765)	0.106* (0.0543)	0.119*** (0.0426)	0.0956** (0.0404)	
	Self finan. Share*Size1	0.0145 (0.104)	0.0207 (0.0705)	0.0916*** (0.0281)	0.0597** (0.0257)	
	Self finan. Share*Size2	0.0897 (0.111)	0.0820 (0.0789)	0.124*** (0.0376)	0.0869** (0.0356)	
	Bank finan.*Size1	-0.0526 (0.129)	-0.0939 (0.0973)	-0.216*** (0.0675)	-0.153** (0.0626)	
	Bank finan.*Size2	-0.356** (0.162)	-0.279** (0.129)	-0.0799 (0.100)	-0.101 (0.0924)	
	Bank finan. Share*Size1	-0.0614 (0.0558)	-0.0634 (0.0396)	-0.105*** (0.0322)	-0.0724** (0.0303)	
	Bank finan. Share*Size2	-0.117 (0.0839)	-0.111* (0.0611)	-0.0276 (0.0523)	-0.0395 (0.0468)	
	Account share*size1	0.0318 (0.0345)	0.0134 (0.0217)	-0.0133 (0.0112)	-0.000488 (0.0101)	
	Account share*size2	0.136** (0.0552)	0.112*** (0.0397)	0.0354 (0.0268)	0.0424 (0.0260)	
	Overdraft fac.*Size1	-0.0636 (0.0462)	-0.0469* (0.0247)	-0.0486*** (0.0152)	-0.0327** (0.0131)	
	Overdraft fac.*Size2	-0.00887 (0.0743)	0.0711 (0.0533)	0.0430 (0.0408)	0.0391 (0.0394)	
	Credit loan*Size1	-0.0375 (0.0539)	-0.0351 (0.0442)	-0.0562 (0.0400)	-0.0425 (0.0381)	
	Credit loan*Size2	0.00455 (0.0841)	0.0535 (0.0648)	-0.0438 (0.0495)	-0.0416 (0.0487)	
	Perception	Finance*Size1	0.00734 (0.0406)	-0.0254 (0.0193)	-0.0231 (0.0147)	-0.0253* (0.0136)
		Finance*Size2	0.190** (0.0824)	0.116* (0.0593)	0.0345 (0.0328)	0.0140 (0.0310)
Doing Business	Credit regis. Cov*Size1	0.00910** (0.00249)	0.00162 (0.000811)	0.00155 (0.000940)	0.00105** (0.000304)	
	Credit regis. Cov*Size2	0.0160*** (0.00264)	0.00797*** (0.00144)	0.00601*** (0.000911)	0.00262*** (0.000138)	
	Credit bureau cov*Size1	-0.0184*** (0.00236)	-0.00578*** (0.00125)	-0.00366* (0.00160)	-0.00200* (0.000800)	
	Credit bureau cov*Size2	-0.0151*** (0.00248)	-0.00301 (0.00147)	-0.00364 (0.00230)	-0.00124 (0.000904)	
Obs	4,209	4,179	4,181	4,159		

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A8. Effect of Finance on GVC (by age)

		OLS				
		Two way	GVC cert.	GVC for.	GVC all	
Factual	Self finan.*Age1	-0.0324 (0.0678)	0.0491 (0.0449)	0.0923*** (0.0353)	0.0681** (0.0328)	
	Self finan.*Age2	0.00498 (0.0659)	0.0569 (0.0453)	0.0899*** (0.0345)	0.0696** (0.0319)	
	Self finan. Share*Age1	0.0323 (0.104)	0.0403 (0.0721)	0.104*** (0.0317)	0.0685** (0.0294)	
	Self finan. Share*Age2	0.0667 (0.105)	0.0495 (0.0734)	0.0977*** (0.0311)	0.0684** (0.0289)	
	Bank finan.*Age1	-0.229* (0.135)	-0.128 (0.100)	-0.138** (0.0686)	-0.125** (0.0626)	
	Bank finan.*Age2	-0.0606 (0.165)	-0.202* (0.116)	-0.210** (0.0886)	-0.148* (0.0842)	
	Bank finan. Share*Age1	-0.113* (0.0609)	-0.0850** (0.0418)	-0.0612* (0.0368)	-0.0603* (0.0322)	
	Bank finan. Share*Age2	-0.0439 (0.0693)	-0.0730 (0.0483)	-0.0937** (0.0390)	-0.0610 (0.0371)	
	Account share*Age1	0.0332 (0.0359)	0.0230 (0.0233)	-0.00446 (0.0116)	0.00515 (0.0103)	
	Account share*Age2	0.0782* (0.0415)	0.0422 (0.0279)	-0.0121 (0.0171)	0.00761 (0.0159)	
	Overdraft fac.*Age1	-0.0565 (0.0511)	-0.0237 (0.0285)	-0.00550 (0.0213)	-0.00643 (0.0186)	
	Overdraft fac.*Age2	-0.0390 (0.0561)	-0.00202 (0.0354)	-0.0476** (0.0226)	-0.0207 (0.0203)	
	Credit loan*Age1	-0.0378 (0.0620)	-0.00701 (0.0499)	-0.0332 (0.0428)	-0.0350 (0.0400)	
	Credit loan*Age2	-0.00844 (0.0637)	-0.0125 (0.0489)	-0.0755* (0.0437)	-0.0502 (0.0430)	
	Perception	Finance*Age1	0.0109 (0.0450)	-0.0145 (0.0266)	-0.0123 (0.0171)	-0.0195 (0.0158)
		Finance*Age2	0.0867* (0.0504)	0.0268 (0.0270)	-0.0115 (0.0174)	-0.0142 (0.0158)
Doing Business	Credit regis. Cov*Age1	0.0104** (0.00287)	0.00353*** (0.000372)	0.00391* (0.00159)	0.00158** (0.000524)	
	Credit regis. Cov*Age2	0.0132*** (0.00182)	0.00475*** (0.000235)	0.00279*** (0.000475)	0.00177*** (0.000139)	
	Credit bureau cov*Age1	-0.0182*** (0.00219)	-0.00486** (0.00114)	-0.00360 (0.00181)	-0.00173* (0.000734)	
	Credit bureau cov*Age2	-0.0163*** (0.00227)	-0.00501** (0.00125)	-0.00370* (0.00173)	-0.00182* (0.000825)	
Obs.	4.247	4.217	4.219	4.197		

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A9. Effect of Fiscal Policy on GVC

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Perceptions	Tax rate	0.0623* (0.0356)	0.0322 (0.0253)	0.00813 (0.0230)	0.00107 (0.0213)
	Tax admin.	0.0297 (0.0420)	0.0172 (0.0322)	0.00859 (0.0283)	0.00769 (0.0275)
Doing Business	Number of pay.	-0.246*** (0.0219)	-0.0598* (0.0228)	-0.0724*** (0.00894)	-0.0294** (0.00819)
	Time to pay tax	-0.289*** (0.0396)	-0.0625* (0.0272)	-0.0649* (0.0255)	-0.0262 (0.0132)
	Total tax rate	0.00627 (0.00760)	0.00189 (0.00223)	0.00310* (0.00145)	0.00124 (0.000769)
	Profit tax	0.00179 (0.00512)	-0.00215 (0.00111)	0.00149 (0.000997)	-0.000106 (0.000409)
	Labor tax and cont	-0.0168** (0.00473)	-0.00133 (0.00177)	-0.00137 (0.00130)	-0.000184 (0.000403)
	Obs.	4,072	4,072	4,072	4,072

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A10. Effect of Fiscal Policy on GVC (by size)

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Perception	Tax rate*Size1	0.0139 (0.0324)	-0.0143 (0.0164)	0.00707 (0.0148)	-0.00338 (0.0117)
	Tax rate*Size2	0.220*** (0.0801)	0.178*** (0.0664)	0.0189 (0.0557)	0.0156 (0.0549)
	Tax admin.*Size1	-0.0261 (0.0359)	-0.0298 (0.0198)	-0.00269 (0.0132)	-0.00409 (0.0119)
	Tax admin.*Size2	0.213** (0.106)	0.168* (0.0882)	0.0514 (0.0816)	0.0465 (0.0807)
Doing Business	Number of pay.*Size1	-0.0146*** (0.00263)	-0.00366 (0.00176)	-0.00408*** (0.000824)	-0.00176* (0.000653)
	Number of pay.*Size2	-0.0120** (0.00300)	-0.00184 (0.00186)	-0.00353* (0.00129)	-0.00105 (0.000772)
	Time to pay tax*Size1	-0.00114*** (0.000194)	-0.000266* (0.000118)	-0.000255* (9.47e-05)	-0.000111 (5.34e-05)
	Time to pay tax*Size2	-0.000944** (0.000209)	-0.000128 (0.000117)	-0.000216 (0.000112)	-5.99e-05 (5.56e-05)
	Total tax rate*Size1	0.00554 (0.00746)	0.00138 (0.00207)	0.00281 (0.00139)	0.00102 (0.000747)
	Total tax rate*Size2	0.00746 (0.00750)	0.00275 (0.00227)	0.00361* (0.00146)	0.00161* (0.000733)
	Profit tax*Size1	0.000341 (0.00499)	-0.00317** (0.00102)	0.000983 (0.00117)	-0.000576 (0.000587)
	Profit tax*Size2	0.00486 (0.00555)	0.000177 (0.00156)	0.00263** (0.000623)	0.000939** (0.000207)
	Labor tax and cont*Size1	-0.0177** (0.00458)	-0.00205 (0.00145)	-0.00175 (0.00124)	-0.000492 (0.000337)
	Labor tax and cont*Size1	-0.0145* (0.00539)	0.000198 (0.00209)	-0.000525 (0.00172)	0.000527 (0.000687)
Obs	4,209	4,179	4,181	4,159	

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A11. Effect of Fiscal Policy on GVC (by age)

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Perception	Tax rate*Age1	0.0416 (0.0398)	0.0326 (0.0296)	0.0127 (0.0262)	0.00603 (0.0241)
	Tax rate*Age2	0.0965** (0.0448)	0.0313 (0.0289)	0.000513 (0.0230)	-0.00715 (0.0218)
	Tax admin.*Age1	-0.00423 (0.0502)	0.00916 (0.0403)	0.0219 (0.0351)	0.0220 (0.0342)
	Tax admin.*Age2	0.0820 (0.0543)	0.0297 (0.0339)	-0.0120 (0.0248)	-0.0143 (0.0238)
Doing Business	Number of pay.*Age1	-0.0141*** (0.00285)	-0.00298 (0.00187)	-0.00386** (0.00100)	-0.00151* (0.000692)
	Number of pay.*Age2	-0.0125** (0.00302)	-0.00284 (0.00189)	-0.00384** (0.00106)	-0.00144 (0.000749)
	Time to pay tax*Age1	-0.00111*** (0.000203)	-0.000220 (0.000120)	-0.000240* (9.74e-05)	-9.45e-05 (5.13e-05)
	Time to pay tax*Age2	-0.000994*** (0.000207)	-0.000209 (0.000121)	-0.000240* (0.000105)	-9.01e-05 (5.68e-05)
	Total tax rate*Age1	0.00561 (0.00760)	0.00177 (0.00217)	0.00328 (0.00154)	0.00128 (0.000787)
	Total tax rate*Age2	0.00668 (0.00746)	0.00195 (0.00225)	0.00300 (0.00145)	0.00122 (0.000771)
	Profit tax*Age1	0.000656 (0.00506)	-0.00226 (0.00112)	0.00209*** (0.000444)	0.000116 (0.000132)
	Profit tax*Age2	0.00270 (0.00516)	-0.00206 (0.00113)	0.00101 (0.00151)	-0.000284 (0.000667)
	Labor tax and cont*Age1	-0.0173** (0.00441)	-0.00143 (0.00176)	-0.00133 (0.00136)	-0.000194 (0.000420)
	Labor tax and cont*Age1	-0.0150** (0.00513)	-0.000993 (0.00190)	-0.00150 (0.00116)	-0.000150 (0.000367)
Obs	4.247	4.217	4.219	4.197	

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A12. Effect of Enforcing Contracts and Insolvency on GVC

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Doing Business	Proc. Enf. Contracts	-3.121*** (0.627)	-0.621 (0.297)	-0.620 (0.323)	-0.239 (0.146)
	Time Enf. Contracts	-0.268 (0.147)	-0.0346 (0.0562)	-0.0691 (0.0402)	-0.0215 (0.0218)
	Cost Enf. Contracts	-0.0120 (0.0356)	-0.00719 (0.00957)	-0.00972 (0.00731)	-0.00445 (0.00350)
	Time Res. Insolvency	-0.231 (0.170)	-0.109** (0.0256)	-0.0831 (0.0508)	-0.0453* (0.0164)
	Cost Res. Insolvency	-0.0235*** (0.00173)	-0.00624*** (0.000877)	-0.00657*** (0.000348)	-0.00283*** (0.000370)
Obs.	4,072	4,072	4,072	4,072	

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A13. Effect of Enforcing Contracts and Insolvency on GVC (by size)

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Doing Business	Proc. Enf. Contracts*Size1	-0.0782*** (0.0152)	-0.0160* (0.00736)	-0.0160 (0.00786)	-0.00638 (0.00350)
	Proc. Enf. Contracts*Size2	-0.0766*** (0.0150)	-0.0149* (0.00696)	-0.0150 (0.00772)	-0.00552 (0.00338)
	Time Enf. Contracts*Size1	-0.000411* (0.000185)	-7.64e-05 (7.19e-05)	-0.000104 (4.88e-05)	-3.89e-05 (2.73e-05)
	Time Enf. Contracts*Size2	-0.000323 (0.000192)	-1.70e-05 (7.41e-05)	-8.11e-05 (5.70e-05)	-1.71e-05 (2.99e-05)
	Cost Enf. Contracts*Size1	-0.0125 (0.0355)	-0.00749 (0.00962)	-0.00988 (0.00730)	-0.00460 (0.00349)
	Cost Enf. Contracts*Size2	-0.00980 (0.0354)	-0.00547 (0.00935)	-0.00891 (0.00734)	-0.00367 (0.00352)
	Time Res. Insolvency*Size1	-0.0805 (0.0932)	-0.0486* (0.0192)	-0.0309 (0.0279)	-0.0200 (0.0101)
	Time Res. Insolvency*Size2	-0.0598 (0.0928)	-0.0326 (0.0164)	-0.0239 (0.0313)	-0.0111 (0.0117)
	Cost Res. Insolvency*Size1	-0.0246*** (0.00190)	-0.00708*** (0.000860)	-0.00685*** (0.000283)	-0.00318*** (0.000407)
	Cost Res. Insolvency*Size2	-0.0214*** (0.00165)	-0.00483*** (0.000748)	-0.00613*** (0.000672)	-0.00220*** (0.000469)
	Obs	4,209	4,179	4,181	4,159

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A14. Effect of Enforcing Contracts and Insolvency on GVC (by age)

		OLS				
		Two way	GVC cert.	GVC for.	GVC all	
Doing Business	Proc. Enf. Contracts*Age1	-0.0771*** (0.0151)	-0.0153 (0.00736)	-0.0156 (0.00806)	-0.00598 (0.00368)	
	Proc. Enf. Contracts*Age2	-0.0757*** (0.0149)	-0.0152 (0.00717)	-0.0159 (0.00825)	-0.00611 (0.00378)	
	Time Enf. Contracts*Age1	-0.000391 (0.000188)	-5.41e-05 (7.46e-05)	-9.46e-05 (5.16e-05)	-3.10e-05 (2.82e-05)	
	Time Enf. Contracts*Age2	-0.000338 (0.000196)	-4.59e-05 (7.46e-05)	-9.32e-05 (5.49e-05)	-2.76e-05 (2.98e-05)	
	Cost Enf. Contracts*Age1	-0.0127 (0.0352)	-0.00727 (0.00955)	-0.00965 (0.00733)	-0.00445 (0.00349)	
	Cost Enf. Contracts*Age2	-0.0106 (0.0350)	-0.00700 (0.00946)	-0.00989 (0.00744)	-0.00447 (0.00353)	
	Time Res. Insolvency*Age1	-0.0832 (0.0930)	-0.0448* (0.0184)	-0.0272 (0.0299)	-0.0168 (0.0108)	
	Time Res. Insolvency*Age2	-0.0650 (0.0891)	-0.0430* (0.0172)	-0.0305 (0.0284)	-0.0179 (0.0101)	
	Cost Res. Insolvency*Age1	-0.0241*** (0.00167)	-0.00627*** (0.000870)	-0.00652*** (0.000339)	-0.00282*** (0.000335)	
	Cost Res. Insolvency*Age2	-0.0221*** (0.00172)	-0.00618*** (0.000910)	-0.00668*** (0.000496)	-0.00284*** (0.000482)	
	Obs		4.247	4.217	4.219	4.197

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A15. Effect of Permits on GVC

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Perception	Permits	0.0605 (0.0545)	0.0463 (0.0475)	0.0526 (0.0424)	0.0430 (0.0421)
	Proc Start bus.	0.365 (0.795)	0.300 (0.186)	0.169 (0.232)	0.115 (0.0892)
	Time start bus.	-0.505 (1.602)	-0.238 (0.480)	-0.387 (0.376)	-0.164 (0.184)
	Cost start bus.	0.00314 (0.0102)	-3.79e-05 (0.00304)	-0.00208 (0.00252)	-0.000779 (0.00124)
Doing Business	Proc cons perm.	-0.134 (0.140)	0.0493 (0.0394)	-0.0318 (0.0290)	0.00630 (0.0119)
	Time cons perm.	-0.214* (0.1000)	-0.0296 (0.0377)	-0.0535 (0.0306)	-0.0170 (0.0148)
	Cost cons perm.	0.0494** (0.0164)	0.0125 (0.00645)	0.0107 (0.00749)	0.00475 (0.00340)
	Proc regis prop.	-0.423*** (0.0669)	-0.147*** (0.00717)	-0.125*** (0.0242)	-0.0614*** (0.00490)
	Time regis prop.	-0.250** (0.0737)	-0.0607* (0.0280)	-0.0441 (0.0320)	-0.0204 (0.0144)
	Cost regis prop.	0.0352** (0.0117)	0.00570 (0.00513)	0.00760 (0.00381)	0.00262 (0.00201)
	Obs.	4,072	4,072	4,072	4,072

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A16. Effect of Permits on GVC (by size)

		OLS				
		Two way	GVC cert.	GVC for.	GVC all	
Perception	Permits*Size1	-0.0251 (0.0433)	-0.0303 (0.0318)	0.0321 (0.0255)	0.0204 (0.0246)	
	Permits*Size2	0.310*** (0.105)	0.271*** (0.0919)	0.114 (0.0880)	0.110 (0.0876)	
Doing Business	Proc Start bus.*Size1	0.0490 (0.101)	0.0353 (0.0220)	0.0215 (0.0296)	0.0136 (0.0113)	
	Proc Start bus.*Size2	0.0590 (0.102)	0.0426 (0.0233)	0.0255 (0.0298)	0.0167 (0.0112)	
	Time start bus.*Size1	-0.0275 (0.120)	-0.0154 (0.0362)	-0.0276 (0.0291)	-0.0116 (0.0141)	
	Time start bus.*Size2	-0.0213 (0.120)	-0.0107 (0.0358)	-0.0253 (0.0292)	-0.00953 (0.0141)	
	Cost start bus.*Size1	0.00235 (0.0101)	-0.000697 (0.00306)	-0.00247 (0.00242)	-0.00126 (0.00125)	
	Cost start bus.*Size2	0.00553 (0.0107)	0.00201 (0.00336)	-0.000898 (0.00300)	0.000689 (0.00143)	
	Proc cons perm.*Size1	-0.0124 (0.00892)	0.00120 (0.00204)	-0.00317* (0.00126)	-0.000346 (0.000416)	
	Proc cons perm.*Size2	-0.00766 (0.0100)	0.00446 (0.00322)	-0.00150 (0.00240)	0.000940 (0.00111)	
	Time cons perm.*Size1	-0.00170 (0.000950)	-0.000331 (0.000316)	-0.000478 (0.000233)	-0.000180 (0.000120)	
	Time cons perm.*Size2	-0.00123 (0.000980)	2.88e-05 (0.000341)	-0.000357 (0.000271)	-5.32e-05 (0.000138)	
	Cost cons perm.*Size1	0.0447** (0.0142)	0.00994* (0.00437)	0.00712 (0.00582)	0.00277 (0.00262)	
	Cost cons perm.*Size2	0.0598** (0.0175)	0.0185 (0.00927)	0.0189* (0.00861)	0.00934* (0.00366)	
	Proc regis prop.*Size1	-0.0706** (0.0157)	-0.0263*** (0.000743)	-0.0205** (0.00539)	-0.0108*** (0.00123)	
	Proc regis prop.*Size2	-0.0630** (0.0150)	-0.0204*** (0.00152)	-0.0182* (0.00678)	-0.00798** (0.00234)	
	Time regis prop.*Size1	-0.00533*** (0.00111)	-0.00138* (0.000514)	-0.00105 (0.000593)	-0.000517 (0.000285)	
	Time regis prop.*Size2	-0.00466** (0.00111)	-0.000930 (0.000454)	-0.000859 (0.000630)	-0.000264 (0.000271)	
	Cost regis prop.*Size1	0.0325** (0.00903)	0.00376 (0.00324)	0.00398 (0.00203)	0.000526 (0.00174)	
	Cost regis prop.*Size2	0.0408* (0.0173)	0.00990 (0.00970)	0.0152* (0.00701)	0.00697** (0.00247)	
	Obs		4,209	4,179	4,181	4,159

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A17. Effect of Permits on GVC (by age)

		OLS				
		Two way	GVC cert.	GVC for.	GVC all	
Perception	Permits*Age1	-0.000326 (0.0595)	0.0464 (0.0533)	0.0523 (0.0485)	0.0468 (0.0482)	
	Permits*Age2	0.156** (0.0727)	0.0462 (0.0529)	0.0529 (0.0405)	0.0371 (0.0396)	
Doing Business	Proc Start bus.*Age1	0.0520 (0.0989)	0.0396 (0.0222)	0.0244 (0.0301)	0.0156 (0.0112)	
	Proc Start bus.*Age2	0.0596 (0.0999)	0.0410 (0.0228)	0.0238 (0.0296)	0.0157 (0.0111)	
	Time start bus.*Age1	-0.0282 (0.119)	-0.0151 (0.0363)	-0.0271 (0.0294)	-0.0114 (0.0143)	
	Time start bus.*Age2	-0.0235 (0.119)	-0.0144 (0.0361)	-0.0276 (0.0297)	-0.0114 (0.0144)	
	Cost start bus.*Age1	0.000856 (0.0107)	-0.000402 (0.00316)	-0.00203 (0.00252)	-0.000853 (0.00122)	
	Cost start bus.*Age2	0.00567 (0.00934)	0.000365 (0.00287)	-0.00213 (0.00258)	-0.000697 (0.00128)	
	Proc cons perm.*Age1	-0.0111 (0.00898)	0.00267 (0.00249)	-0.00232 (0.00191)	0.000242 (0.000773)	
	Proc cons perm.*Age2	-0.00780 (0.0102)	0.00333 (0.00290)	-0.00233 (0.00164)	0.000420 (0.000712)	
	Time cons perm.*Age1	-0.00166 (0.000930)	-0.000222 (0.000328)	-0.000439 (0.000238)	-0.000143 (0.000121)	
	Time cons perm.*Age2	-0.00130 (0.00100)	-0.000166 (0.000329)	-0.000424 (0.000255)	-0.000120 (0.000130)	
	Cost cons perm.*Age1	0.0452** (0.0148)	0.0112 (0.00558)	0.0125 (0.00860)	0.00502 (0.00367)	
	Cost cons perm.*Age2	0.0538** (0.0169)	0.0138 (0.00705)	0.00871 (0.00705)	0.00447 (0.00328)	
	Proc regis prop.*Age1	-0.0707*** (0.0146)	-0.0247*** (0.000859)	-0.0195** (0.00605)	-0.00987*** (0.00160)	
	Proc regis prop.*Age2	-0.0647** (0.0151)	-0.0242*** (0.000682)	-0.0203** (0.00542)	-0.0101*** (0.00125)	
	Time regis prop.*Age1	-0.00531*** (0.00110)	-0.00126* (0.000482)	-0.000975 (0.000585)	-0.000443 (0.000259)	
	Time regis prop.*Age2	-0.00477** (0.00108)	-0.00121* (0.000488)	-0.00103 (0.000624)	-0.000454 (0.000294)	
	Cost regis prop.*Age1	0.0355** (0.00990)	0.00541 (0.00359)	0.0120* (0.00446)	0.00419* (0.00178)	
	Cost regis prop.*Age2	0.0348* (0.0138)	0.00602 (0.00689)	0.00270 (0.00388)	0.000870 (0.00267)	
	Obs		4.247	4.217	4.219	4.197

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A18. Effect of Informality on GVC (by age and by size)

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Factual	Informality	-0.0117 (0.0349)	-0.0522** (0.0263)	-0.0497** (0.0199)	-0.0366* (0.0189)
	Sales inf. Pay.	0.00191 (0.00265)	0.000874 (0.00246)	-0.000964 (0.000683)	-0.000351 (0.000601)
Perception	Informality	-0.0496 (0.0362)	-0.0594*** (0.0226)	-0.0239 (0.0161)	-0.0200 (0.0146)
Factual	Informality*Size1	-0.0186 (0.0350)	-0.0548** (0.0241)	-0.0482*** (0.0185)	-0.0341** (0.0173)
	Informality*Size2	0.0141 (0.0592)	-0.0410 (0.0437)	-0.0590** (0.0283)	-0.0472* (0.0274)
	Sales inf. Pay.*Size1	-0.00155 (0.00446)	-0.00511*** (0.00190)	-0.000246 (0.000722)	-0.000248 (0.000614)
	Sales inf. Pay.*Size2	0.00357 (0.00353)	0.00411 (0.00274)	-0.00156* (0.000944)	-0.000397 (0.000876)
Perception	Informality*Size1	-0.0568 (0.0363)	-0.0584*** (0.0197)	-0.0258* (0.0150)	-0.0203 (0.0134)
	Informality*Size2	-0.0241 (0.0715)	-0.0648 (0.0462)	-0.0148 (0.0249)	-0.0191 (0.0229)
Factual	Informality*Age1	-0.0338 (0.0374)	-0.0576** (0.0254)	-0.0454** (0.0181)	-0.0319* (0.0167)
	Informality*Age2	0.0170 (0.0420)	-0.0451 (0.0318)	-0.0551** (0.0238)	-0.0428* (0.0230)
	Sales inf. Pay.*Age1	-0.00349 (0.00367)	-0.000124 (0.00327)	-0.00115 (0.000893)	-0.000267 (0.000813)
	Sales inf. Pay.*Age2	0.00775 (0.00524)	0.00195 (0.00341)	-0.000766 (0.000940)	-0.000441 (0.000758)
Perception	Informality*Age1	-0.0838** (0.0426)	-0.0678*** (0.0254)	-0.0234 (0.0171)	-0.0196 (0.0153)
	Informality*Age2	-0.00147 (0.0445)	-0.0475* (0.0270)	-0.0246 (0.0185)	-0.0206 (0.0170)
Obs.		4,072	4,072	4,072	4,072

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A19. Effect of Trade Procedures on GVC

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Perception	Trade obs.	0.0878 (0.0655)	0.121** (0.0581)	0.0185 (0.0408)	0.0286 (0.0399)
	Doc to exp.	-0.386*** (0.0803)	-0.0772 (0.0434)	-0.0892* (0.0340)	-0.0333 (0.0186)
	Doc to imp.	-0.379* (0.157)	-0.0607 (0.0631)	-0.0924 (0.0461)	-0.0299 (0.0247)
Doing Business	Cost to exp.	0.393 (0.350)	0.169 (0.0801)	0.0543 (0.0894)	0.0487 (0.0356)
	Cost to imp.	0.540** (0.120)	0.0855** (0.0190)	0.0352 (0.0184)	0.0148 (0.00845)
	Time to exp.	0.587* (0.250)	0.173 (0.102)	0.0633 (0.0837)	0.0449 (0.0429)
	Time to imp.	0.605 (0.297)	0.151 (0.102)	0.0869 (0.107)	0.0448 (0.0480)
Obs.		4,072	4,072	4,072	4,072

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A20. Effect of Trade Procedures on GVC (by size)

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Perception	Trade obs.*Size1	-0.0454 (0.0487)	-0.0211 (0.0243)	-0.0134 (0.0152)	-0.00515 (0.0132)
	Trade obs.*Size2	0.404*** (0.114)	0.458*** (0.106)	0.0960 (0.108)	0.108 (0.106)
Doing Business	Doc to exp.*Size1	-0.0651** (0.0149)	-0.0134 (0.00757)	-0.0157** (0.00556)	-0.00670* (0.00314)
	Doc to exp.*Size2	-0.0579** (0.0153)	-0.00964 (0.00742)	-0.0119 (0.00635)	-0.00266 (0.00317)
	Doc to imp.*Size1	-0.0512* (0.0191)	-0.00930 (0.00780)	-0.0131* (0.00541)	-0.00515 (0.00293)
	Doc to imp.*Size2	-0.0446* (0.0194)	-0.00577 (0.00774)	-0.00958 (0.00610)	-0.00178 (0.00310)
	Cost to exp.*Size1	0.000556 (0.000429)	0.000202* (9.23e-05)	5.39e-05 (0.000114)	4.54e-05 (4.57e-05)
	Cost to exp.*Size2	0.000630 (0.000443)	0.000261* (0.000112)	0.000111 (0.000119)	9.06e-05 (4.65e-05)
	Cost to imp.*Size1	0.000439** (0.000106)	6.50e-05** (2.00e-05)	1.94e-05 (1.64e-05)	5.53e-06 (7.30e-06)
	Cost to imp.*Size2	0.000507*** (0.000102)	0.000113** (2.87e-05)	6.27e-05** (1.77e-05)	4.28e-05* (1.77e-05)
	Time to exp.*Size1	0.0339* (0.0133)	0.00852 (0.00537)	0.00228 (0.00411)	0.00150 (0.00208)
	Time to exp.*Size2	0.0392** (0.0138)	0.0127 (0.00599)	0.00582 (0.00471)	0.00445 (0.00247)
	Time to imp.*Size1	0.0247* (0.0113)	0.00535 (0.00369)	0.00242 (0.00380)	0.00108 (0.00166)
	Time to imp.*Size2	0.0292* (0.0115)	0.00879 (0.00427)	0.00526 (0.00426)	0.00343 (0.00197)
Obs.		4,072	4,072	4,072	4,072

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A21. Effect of Trade Procedures on GVC (by age)

		OLS				
		Two way	GVC cert.	GVC for.	GVC all	
Perception	Trade obs.*Age1	0.0921 (0.0912)	0.142* (0.0794)	0.0280 (0.0577)	0.0386 (0.0565)	
	Trade obs.*Age2	0.0822 (0.0604)	0.0938* (0.0521)	0.00588 (0.0252)	0.0153 (0.0241)	
Doing Business	Doc to exp.*Age1	-0.0652** (0.0152)	-0.0121 (0.00767)	-0.0143* (0.00572)	-0.00519 (0.00302)	
	Doc to exp.*Age2	-0.0565** (0.0157)	-0.0116 (0.00745)	-0.0142* (0.00616)	-0.00518 (0.00350)	
	Doc to imp.*Age1	-0.0509* (0.0192)	-0.00800 (0.00791)	-0.0117 (0.00563)	-0.00382 (0.00297)	
	Doc to imp.*Age2	-0.0432 (0.0203)	-0.00732 (0.00780)	-0.0115 (0.00607)	-0.00368 (0.00331)	
	Cost to exp.*Age1	0.000536 (0.000429)	0.000221* (9.36e-05)	8.16e-05 (0.000120)	6.53e-05 (4.82e-05)	
	Cost to exp.*Age2	0.000643 (0.000419)	0.000236* (0.000105)	7.65e-05 (0.000112)	6.55e-05 (4.48e-05)	
	Cost to imp.*Age1	0.000421** (0.000102)	7.02e-05** (2.15e-05)	3.22e-05* (1.40e-05)	1.42e-05 (9.12e-06)	
	Cost to imp.*Age2	0.000490*** (0.000104)	7.63e-05*** (1.54e-05)	2.11e-05 (1.72e-05)	9.70e-06 (7.27e-06)	
	Time to exp.*Age1	0.0322* (0.0133)	0.00931 (0.00549)	0.00357 (0.00463)	0.00242 (0.00247)	
	Time to exp.*Age2	0.0385** (0.0136)	0.0101 (0.00588)	0.00303 (0.00417)	0.00228 (0.00218)	
	Time to imp.*Age1	0.0234 (0.0111)	0.00591 (0.00367)	0.00344 (0.00423)	0.00177 (0.00193)	
	Time to imp.*Age2	0.0281* (0.0115)	0.00646 (0.00399)	0.00286 (0.00381)	0.00158 (0.00168)	
	Obs.		4,072	4,072	4,072	4,072

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A22. Effect of Security on GVC

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Factual	Theft	-0.00309 (0.00213)	8.97e-05 (0.00160)	-0.00141 (0.000874)	-0.00110 (0.000811)
	Break	-0.0123*** (0.00310)	-0.00434** (0.00185)	-0.000154 (0.000564)	-6.62e-05 (0.000439)
Perception	Courts	0.0425 (0.0604)	-0.000204 (0.0501)	0.0260 (0.0432)	0.0178 (0.0425)
	Crime	0.0316 (0.0471)	-0.00974 (0.0305)	-0.0272 (0.0233)	-0.0259 (0.0224)
	Political stab.	0.100** (0.0467)	0.0336 (0.0255)	0.0106 (0.0161)	0.00178 (0.0133)
	Corruption	0.0342 (0.0350)	0.00852 (0.0224)	0.00925 (0.0159)	0.0116 (0.0146)
Doing Business	Protec Inv. (Disclosure)	-0.0150 (0.0676)	-0.0140 (0.0219)	-0.0116 (0.0154)	-0.00655 (0.00753)
	Protec Inv. (Liability)	0.0572* (0.0217)	0.0214*** (0.00409)	0.0185** (0.00579)	0.00918*** (0.00183)
Obs.		4,072	4,072	4,072	4,072

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A23. Effect of Security on GVC (by size)

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Factual	Theft*Size1	-0.00262 (0.00192)	0.000945 (0.00145)	-0.000777 (0.000662)	-0.000681 (0.000623)
	Theft*Size2	-0.00547 (0.00932)	-0.00529 (0.00783)	-0.00492* (0.00268)	-0.00373 (0.00244)
	Break*Size1	-0.0109*** (0.00310)	-0.00350** (0.00157)	0.000291 (0.000531)	-0.000341 (0.000449)
	Break*Size2	-0.0135*** (0.00418)	-0.00509* (0.00299)	-0.000299 (0.00116)	0.000305 (0.000892)
Perception	Courts*Size1	-0.0251 (0.0519)	-0.0527* (0.0296)	0.00478 (0.0170)	0.000517 (0.0150)
	Courts*Size2	0.197 (0.125)	0.119 (0.114)	0.0760 (0.105)	0.0574 (0.105)
	Crime*Size1	0.0373 (0.0457)	0.00374 (0.0276)	-0.0272 (0.0201)	-0.0286 (0.0192)
	Crime*Size2	0.0287 (0.101)	-0.0435 (0.0632)	-0.0206 (0.0437)	-0.0179 (0.0420)
	Political stab.*Size1	0.0726 (0.0452)	0.0129 (0.0241)	0.00413 (0.0148)	-0.00486 (0.0117)
	Political stab.*Size2	0.186*** (0.0646)	0.0970** (0.0387)	0.0364 (0.0244)	0.0211 (0.0227)
	Corruption*Size1	0.00687 (0.0334)	-0.0126 (0.0180)	0.00186 (0.0123)	0.00310 (0.0102)
	Corruption*Size2	0.117** (0.0593)	0.0712 (0.0445)	0.0328 (0.0294)	0.0345 (0.0288)
Doing Business	Protec Inv. (Disclosure)*Size1	-0.0177 (0.0674)	-0.0164 (0.0218)	-0.0121 (0.0153)	-0.00715 (0.00753)
	Protec Inv. (Disclosure)*Size2	-0.00387 (0.0683)	-0.00360 (0.0217)	-0.00957 (0.0163)	-0.00407 (0.00780)
	Protec Inv. (Liability)*Size1	0.0476 (0.0226)	0.0144** (0.00403)	0.0131 (0.00671)	0.00633* (0.00248)
	Protec Inv. (Liability)*Size2	0.0697** (0.0201)	0.0307*** (0.00446)	0.0258** (0.00647)	0.0130*** (0.00154)
Obs.	4,072	4,072	4,072	4,072	

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1

(iii) All regressions include country, sector and year dummies.

Table A24. Effect of Security on GVC (by age)

		OLS			
		Two way	GVC cert.	GVC for.	GVC all
Factual	Theft*Age1	-0.00768** (0.00387)	0.00133 (0.00316)	-0.00177* (0.00100)	-0.00124 (0.000956)
	Theft*Age2	5.45e-05 (0.00233)	-0.000758 (0.00179)	-0.00116 (0.000934)	-0.001000 (0.000882)
	Break*Age1	-0.0125*** (0.00315)	-0.00391** (0.00175)	0.000233 (0.000564)	0.000307 (0.000442)
	Break*Age2	-0.0116** (0.00583)	-0.00620 (0.00431)	-0.00182 (0.00163)	-0.00167 (0.00140)
Perception	Courts*Age1	0.0113 (0.0785)	0.00863 (0.0682)	0.0558 (0.0621)	0.0486 (0.0613)
	Courts*Age2	0.0850 (0.0721)	-0.0122 (0.0471)	-0.0145 (0.0254)	-0.0240 (0.0235)
	Crime*Age1	-0.0185 (0.0457)	-0.0208 (0.0289)	-0.0204 (0.0241)	-0.0197 (0.0230)
	Crime*Age2	0.142* (0.0856)	0.0147 (0.0501)	-0.0420 (0.0277)	-0.0396 (0.0270)
	Political stab.*Age1	0.0807* (0.0477)	0.0271 (0.0258)	0.00816 (0.0170)	-0.00152 (0.0143)
	Political stab.*Age2	0.131*** (0.0505)	0.0437 (0.0288)	0.0144 (0.0161)	0.00697 (0.0133)
	Corruption*Age1	0.0244 (0.0381)	0.0148 (0.0245)	0.0152 (0.0180)	0.0166 (0.0167)
	Corruption*Age2	0.0489 (0.0394)	-0.000860 (0.0251)	0.000411 (0.0146)	0.00431 (0.0132)
Doing Business	Protec Inv. (Disclosure)*Age1	-0.0179 (0.0674)	-0.0140 (0.0220)	-0.0113 (0.0153)	-0.00648 (0.00742)
	Protec Inv. (Disclosure)*Age2	-0.0117 (0.0671)	-0.0139 (0.0218)	-0.0120 (0.0156)	-0.00663 (0.00769)
	Protec Inv. (Liability)*Age1	0.0504* (0.0236)	0.0198*** (0.00394)	0.0204* (0.00736)	0.00921** (0.00222)
	Protec Inv. (Liability)*Age2	0.0628** (0.0195)	0.0228*** (0.00422)	0.0170** (0.00539)	0.00915*** (0.00169)
Obs.	4,072	4,072	4,072	4,072	

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) *** p<0.01, ** p<0.05, * p<0.1 (iii) All regressions include country, sector and year dummies.

Appendix 3

Further results

Table A25. Effect of Factual Variables on GVC

	OLS	
	Two way	GVC for.
<i>Infrastructure</i>		
Power Outage	0.0508 (0.0452)	0.0320 (0.0253)
Generator	0.178*** (0.0573)	0.0218 (0.0240)
Water	0.0375 (0.0320)	0.0122 (0.0169)
<i>Finance</i>		
Self finan.	0.000846 (0.0658)	0.0977*** (0.0347)
Self finan. Share	0.0480 (0.101)	0.103*** (0.0312)
Bank finan.	-0.138 (0.111)	-0.160** (0.0684)
Bank finan. Share	-0.0766 (0.0520)	-0.0761** (0.0338)
Account share	0.0458 (0.0342)	-0.00741 (0.0122)
Overdraft fac.	-0.0541 (0.0443)	-0.0247 (0.0155)
Credit loan	-0.0378 (0.0520)	-0.0571 (0.0398)
<i>Security</i>		
Theft	-0.00274 (0.00211)	-0.00131 (0.000873)
Break	-0.0113*** (0.00306)	0.000146 (0.000621)
<i>Informality</i>		
Informality	-0.00247 (0.0338)	-0.0467** (0.0188)
Sales inf. Pay.	0.00249 (0.00253)	-0.000767 (0.000760)
Observations	4,072	4,072

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) The certification variable is introduced on the righthand side as an explanatory variable.

(iii) *** p<0.01, ** p<0.05, * p<0.1

(iv) All regressions include country, sector and year dummies.

Table A26. Effect of Perception based Variables on GVC

	OLS	
	Two way	GVC for.
Electricity	0.0523 (0.0403)	0.00311 (0.0185)
Telecom	0.132** (0.0585)	0.0298 (0.0384)
Transport	0.00419 (0.0432)	-0.0283 (0.0174)
Tax rate	0.0495 (0.0345)	0.00413 (0.0227)
Tax admin	0.0182 (0.0409)	0.00482 (0.0277)
Permits	0.0553 (0.0509)	0.0508 (0.0411)
Labor	-0.0437 (0.0407)	-0.0222 (0.0141)
Education	0.0957** (0.0456)	0.0334 (0.0250)
Finance	0.0409 (0.0392)	-0.0130 (0.0154)
Trade	0.0768 (0.0609)	0.0148 (0.0397)
Courts	0.0492 (0.0583)	0.0283 (0.0422)
Crime	0.0436 (0.0473)	-0.0232 (0.0223)
Politics	0.107** (0.0464)	0.0129 (0.0160)
Corruption	0.0285 (0.0343)	0.00739 (0.0154)
Informality	-0.0425 (0.0366)	-0.0218 (0.0156)
Observations	4,072	4,072

Notes: (i) Each line represents an individual regression. Robust standard errors in parentheses.

(ii) The certification variable is introduced on the righthand side as an explanatory variable.

(iii) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

(iv) All regressions include country, sector and year dummies.