

## ADB Working Paper Series on Regional Economic Integration



### The Role of International Trade in Employment Growth in Micro- and Small Enterprises: Evidence from Developing Asia

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Asian Development Bank





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Asian Development Bank

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## **Abstract**

This paper examines the role of international trade in employment growth in micro- and small enterprises using a representative sample of manufacturing firms in six Southeast Asian countries. After controlling for firm and individual characteristics as well as country and sector dummies, participation in international trade plays a significant role in explaining this growth, boosting firm-level growth by 3% per year on average. The fact that firms start exporting quickly after their foundation suggests that reverse causality is not an issue for our estimates. However, biases arising from unobserved heterogeneity cannot be ruled out. Therefore, we exploit the fact that firms were exposed to unexpected variation in real exchange rates between 2005 and 2008 to investigate the causal relationship between trade and employment growth. The results are not conclusive, but they do not suggest that the relationship is driven by unobserved heterogeneity.

*Keywords:* MSE graduation, trade, employment growth

*JEL Classification:* O12, D22

## 1. Introduction

The motivation for this paper stems from the importance of micro- and small enterprises (MSEs) as a source of employment in developing countries. Firms with six workers or fewer account for roughly 50% of all employment in Latin America and substantially more than half in Africa and Southeast Asia, with their most significant contributions being made in urban areas (Fajnzylber et al. 2006).

Furthermore, it has been observed empirically that despite the severe constraints faced by MSEs in developing countries, a significant number of them have managed to expand, indicating that they do have potential to drive economic growth. However, based on the characteristics of these successful firms there appears to be a significant number of firms that have, so far, failed to realize their growth potential (Grimm et al. 2012). Helping MSEs to grow is desirable not only to provide employment, but also to provide better employment. Wages in small enterprises tend to be low and it is usually difficult for owners to provide workers with social security benefits unless the firm can graduate into a bigger and more efficient firm.<sup>1</sup> In this context, it is important to understand what constraints prevent firms from realizing their growth potential. Lack of access to credit has been acknowledged by numerous authors as a fundamental constraint to business expansion, especially for MSEs (Dinh et al. 2010; Bigsten et al. 2003). However, there are other major constraints receiving less attention that are specific to MSEs, such as business risks and a lack of access to markets, inputs, and technology.

This paper focuses on the role of international trade in employment growth, with a special focus on MSEs. There are several ways in which participating in international markets can, in theory, help firms to overcome growth constraints. Exporting is one important channel to overcome the small size of local markets and low elasticity of demand. Empirical evidence also shows that exporting helps firms to grow and boost productivity through learning effects and the exploitation of economies of scale (van Biesebroeck 2005; Fafchamps et al. 2004). Similarly, firms in developing countries may be constrained in input markets: many inputs are not produced locally and most equipment is imported from abroad.

Using a representative sample of manufacturing firms in Indonesia, Malaysia, Lao People's Democratic Republic (Lao PDR), Thailand, the Philippines, and Viet Nam, we find that since their foundation firms that started in the lowest quintile of the initial size distribution grew by about 20% annually, compared with about 10% for the average firm. Although their small initial size reduces their contribution to overall employment creation, they nonetheless account for a substantial 15% of total employment creation in the six countries during the period under review. We also find that after controlling for firm and individual characteristics as well as country and sector dummies, participating in international trade boosts employment growth by 3% annually on average. In order to control for potential unobserved heterogeneity, we employ an instrumental variable approach, exploiting the natural experiment created by unexpected variation in exchange rates between 2005 and 2008. Although the results are not conclusive, they

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<sup>1</sup> In this paper, we measure enterprise growth by the growth in full-time employees since enterprise foundation.

provide no evidence to suggest that the relationship between firm growth and participation in international trade is driven by endogeneity bias. To provide information for policymakers we define top performers as firms in the top quintile of the employment growth distribution. We find that about one-third of top performing firms started as an MSE and that participating in international trade or having an owner with a college degree increases the probability of being a top performer by about 10% and 5%, respectively.

The remainder of the paper is organized as follows. Section 2 provides an overview of the recent economic literature on potential constraints faced by enterprises in developing countries and the role of MSEs. Section 3 describes the empirical findings and Section 4 concludes and derives policy implications.

## 2. Literature Review

Evidence from around the world shows the importance of MSEs in generating employment, especially in developing countries.<sup>2</sup> Firms with six workers or fewer account for roughly 50% of employment in Latin America and substantially more than half in Africa and Southeast Asia (Fajnzylber et al. 2006). Fox and Sohnesen (2012) find that small-scale household enterprises generated most new jobs outside agriculture and earnings from household enterprises have the same marginal effect on consumption as wage and salary employment. Given the magnitude of the MSE sector it is important to understand whether these enterprises are merely low-productivity, subsistence activities (Banerjee and Newman 1993; Lloyd–Ellis and Bernhardt 2000) or have the potential to grow and contribute to employment creation and economic growth (Grimm et al. 2012).

### 2.1 Empirical Evidence of Heterogeneous MSE Growth Patterns

McMillan and Woodruff (2002) provide evidence of the potential of newly founded firms, mostly small firms, in transitional and developing economies such as the Russian Federation, People's Republic of China (PRC), Poland, and Viet Nam. The example of Viet Nam, in particular, shows the potential of MSEs. Between 1992 and 1995, private sector employment in Viet Nam grew by about 2.5 million, almost all of which can be attributed to small manufacturing firms and the expansion of household enterprises in the retail and repair sectors. In the PRC, newly founded, mostly small enterprises contributed substantially to the fact that the share of industrial production of rural firms rose from 9% in 1978 to 30% in 1991. These two examples in developing countries demonstrate the potential for small firm growth in developing and transitional economies. Mead and Liedholm (1998) find that since their foundation MSEs created almost twice as many jobs as formally registered large-scale enterprises in Botswana, Kenya, Malawi, Swaziland, and Zimbabwe, although overall employment growth in these countries in the 1990s was slow. The study also finds MSE growth to be heterogeneous. The authors show that most of the MSE growth can be attributed to a minority of enterprises, although even these added only a few workers. They find average annual growth rates

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<sup>2</sup> MSEs are frequently defined as firms with up to five permanent workers (Nichter and Goldmark 2009; Liedholm 2002).



of MSEs to be between 4% (Swaziland) and 24% (Kenya). Only 27% of all enterprises grew in size over the period under review, creating 0.14 jobs per year on average. The study also analyzes the income generated by MSEs and finds that returns to labor rise substantially for enterprises that consist of more than one person. This increase in efficiency is associated with higher levels of income for employees and enterprise owners.

Another study examines firm growth between 2006 and 2010. Dinh et al. (2010) use data from the World Bank Enterprise Surveys (WBES) to examine determinants of average annual firm growth. The study uses a cross-sectional data set with almost 40,000 observations from 98 countries. The findings show that firm growth is highest for enterprises with fewer than 10 employees. Firms that had been established in the previous 5 years grew faster than older firms, and average enterprise growth was lowest in East Asia and the Pacific, and highest in South Asia.<sup>3</sup> Following the growth diagnostic approach by Hausman et al. (2005), the study identifies financial constraints and informal sector competition as the most binding constraints to firm growth in developing countries. Though the study mentions firm heterogeneity between and within countries, the analysis does not include empirical results at the country level.

Sleuwagen and Goedhuys (2002) analyze the firm growth process in Côte d'Ivoire using a representative sample of manufacturing firms. The empirical results show a negative relationship between firm growth and firm age and size in Côte d'Ivoire. However, comparing firm growth by enterprise size between Côte d'Ivoire and Germany shows differences in growth patterns between developed and developing countries. This is an extreme example as Germany is well known for its broad base of small and medium-sized enterprises, but similar results are also shown for other developed countries.<sup>4</sup> Small enterprises grew relatively fast in Germany, as evidenced by the fact that 28% of Germany's large and medium-sized firms (100 or more employees) started as micro enterprises (1–4 employees). In Côte d'Ivoire, only a few large firms started small but larger enterprises (with more than 50 employees) grew faster than in Germany. The findings are consistent with a “missing middle” in the firm size distribution in developing countries.

To sum up, the reviewed empirical literature on firm growth in developing countries shows that such growth is heterogeneous, particularly for MSEs, which account for the majority of firms in most developing countries. Also in most countries, only a few MSEs show rapid growth. The next section sums up studies on different groups of constraints and identifies the research gap on for the role of trade for employment growth in MSEs in Southeast Asia.

## 2.2 What Constraints Impede MSE Growth?

We assume that the relatively high concentration of MSEs in developing countries and the heterogeneous growth patterns of these firms can be explained by certain

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<sup>3</sup> The other subregional groups are Sub-Saharan Africa, Europe and Central Asia, Latin America and the Caribbean, and the Middle East and North Africa.

<sup>4</sup> See Stenkula (2006) for an overview of firm size distribution of European countries.

constraints these enterprises face. An overview study by Nichter and Goldmark (2009) lends support to this hypothesis. The authors review the most influential studies on firm growth in developing countries over the past 50 years and identify four key factors associated with low growth in developing countries: (i) individual characteristics (e.g., education, gender, or work experience), (ii) firm characteristics (e.g. age, size, access to finance), (iii) relational factors (e.g., value chains or social networks), and (iv) contextual factors (e.g., business environment).

### **2.2.1 Credit Constraints**

One frequently studied and well-confirmed constraint to enterprise growth is a lack of access to finance due to credit market imperfections. Numerous studies have examined the role of credit constraints in hindering firm expansion (Tybout 1983; Dinh et al. 2010; Dollar et al. 2005). Bigsten et al. (2003) use firm data from Burundi, Côte d'Ivoire, Ghana, Kenya, and Zimbabwe and find that even though demand for credit in Africa seems small, the success rates in loan applications for bigger firms are substantially higher than success rates for small firms. The findings show that 33% of all firms in the sample are credit constrained. However, only 10% of large firms are credit constrained compared with 64% of micro-sized firms.<sup>5</sup>

In addition, there is some evidence that young and small firms are particularly affected by capital constraints (Beck et al. 2005; Evans and Jovanovic 1989). Taking together the findings on firm growth and capital constraints, it is reasonable to assume that capital constraints influence firm size distribution. Theoretical and empirical work show that credit constraints can skew firm size distribution toward smaller firms and that the skewedness decreases with firm age (Cooley and Quadrini 2001; Dinh et al. 2010; Angelini and Generale 2008).

Finally, the finding of high returns to capital in MSEs in Latin America, Africa, and Asia confirms the presence of credit constraints in developing countries (McKenzie and Woodruff 2006; Udry and Anagol 2006; de Mel et al. 2008).

### **2.2.2 Risk**

Another important influence on firm growth that is particularly relevant for MSEs is business risk. Cash flow, especially for young MSEs in developing countries, can be volatile. Hence, risk-averse entrepreneurs might be reluctant to take the steps necessary to start capital accumulation, which in turn may prevent them from investing in new technologies that can boost efficiency (Binswanger and Rosenzweig 1986). Also, due to partially irreversible investments, firms might need a liquidity premium such as a level of precautionary savings deemed comfortable enough for the investment (Fafchamps and Pender 1997). As Fafchamps (1999) points out, “true business risk” might be accompanied by opportunistic or contractual risk if no proper contract enforcement mechanisms are in place, which is likely to be the case in developing countries. In particular, in a risky environment where contract enforcement is difficult, it is easy to claim the inability to stick to obligations agreed to with a business counterpart. This

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<sup>5</sup> A credit-constrained firm is defined as a firm that requested a loan but was rejected.

example makes it clear that business risk is related to institutional and governance constraints such as contract enforcement. The effect of institutional weaknesses and corruption on firm growth has been quantified by Fisman and Svensson (2007) in the case of Uganda. The study finds that a 1% increase in bribery reduces firm growth by 3%.<sup>6</sup> The empirical evidence of the effects of risk on marginal returns to capital is mixed as the expected positive effects cannot be confirmed (McKenzie and Woodruff 2006; de Mel et al. 2008; Grimm et al. 2011).

### **2.2.3 Individual Characteristics**

Besides credit constraints and risk, individual characteristics of the firm owner have also been found to influence firm growth. Often these individual characteristics are interlinked with other constraints such as a lack of access to credit.

The educational attainment of enterprise heads or the entrepreneurial ability of owners may also interact with other constraints to MSE growth. It seems to be the case that a country-specific threshold needs to be reached before one can observe a positive correlation between educational attainment and firm performance (Nichter and Goldmark 2009; McKenzie and Woodruff 2006). Also, education may interact with other individual characteristics such as gender (de Mel et al. 2009).

A recent stream of literature uses randomized experiments to analyze the success of MSEs from a gender perspective. The studies show how the impact of interventions, which aim to reduce barriers to firm growth such as credit constraints, also depends on individual characteristics. These experiments randomly allocate cash or in-kind transfers to enterprises and analyze the effects on the firms. Such experiments have been carried out in Ghana (Fafchamps et al. 2011), Sri Lanka (de Mel et al. 2009), and the Philippines (Karlan and Zinman 2009). The results from Ghana show no effect of randomly allocated grants in enterprises run by women with initial profits below the median. In Sri Lanka, men invest the randomly allocated grants and as a consequence profits rise by up to 14% of the grant amount. Women, by contrast, only invest large grants but do not earn any return on this investment. In the Philippines, randomly allocated microcredit increases profits only in male-led enterprises, which in turn use the extra money to send their children to school. The loans have no effect on profits in enterprises led by women.

### **2.2.4 Access to Markets, Inputs, and Technology**

Another set of constraints to MSE growth originates from demand-side issues, input unavailability, and a lack of technology. A small domestic market and, hence, limited domestic demand, potentially combined with low elasticity of demand for the particular products commonly produced by MSEs, may impede firms from growing (Lachaud 1990). Recent empirical evidence confirms the importance of this constraint (Böhme and Thiele 2012).

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<sup>6</sup> The question used to measure bribes was the following: "Many business people have told us that firms are often required to make informal payments to public officials to deal with customs, taxes, licenses, regulations, services, etc. Can you estimate what a firm in your line of business and of similar size and characteristics typically pays each year?" (Fisman and Svensson 2007, p. 68).

Exporting is evidently an instrument to overcome the small size of local markets in developing countries (Bigsten et al. 2004; Diao et al. 2006). Empirical evidence from Asia and Africa shows that after entering the export market productivity increases occur, which can be largely attributed to the exploitation of scale economies (van Biesebroeck 2005).<sup>7</sup> Firms may also be constrained by input markets if certain inputs are not produced locally and most equipment used is imported from abroad.

In addition to the traditional pattern of exporting (e.g., from a developing country that has comparative advantage in relatively low-skilled textile manufacturing to a developed country), falling transport costs and reduced trade barriers, as well as rapid advancements in production technology, have made it possible for large international firms to “slice up the value chain” (Krugman et al. 1995). This relatively new phenomenon of regional and global production networks means that it can be easier for firms to start exporting since they can specialize in only one small step of the production process. This new trend is confirmed by the fact that production network trade has generally grown faster than total world trade in manufacturing (Athukorala 2011).

Benefits from participating in global markets might also stem from the increasing presence of foreign firms in domestic markets. The evidence on whether the presence of foreign firms creates employment and boosts the success of domestic firms is ambiguous. As described by Markusen and Venables (1999) using the example of Taipei, China, it can be the case that foreign firms create additional demand for local products and services, boosting firm growth. On the other hand, it is argued that foreign firms compete with local firms both for markets and skilled workers, and hence crowd out local firms (Aitken and Harrison 1999; Backer and Sleuwaegen 2003). In addition to employment effects caused by the presence of foreign firms, there might also be positive skill or technology spillover effects.<sup>8</sup> However, empirical evidence of these spillover effects is mixed (Görg and Greenaway 2004).

Given the rapid growth of opportunities for participation in international trade via production networks, this paper will focus on the effects of engaging in international trade on employment growth in MSEs using data from six Southeast Asian economies. The MSE sector’s importance in Asia is evidenced by the fact that it accounts for substantially more than 50% of employment in the region. The constraint of access to markets, inputs, and technology is particularly relevant for the region as many countries either are plugged into, or would like to plug into, regional or global production networks. This paper tries to fill the research gap on the effects of trade and investment liberalization on employment growth. In particular we will examine the following questions:

- (i) Can we observe employment growth in MSEs, and if so, do firms that started small contribute to overall employment growth?
- (ii) What role does participating in international trade play in employment growth?

<sup>7</sup> See also Wagner (2012) for an overview on empirical studies examining the relationship between exporting and productivity.

<sup>8</sup> One possible channel for such spillovers is the skill acquisition channel: foreign firms provide training to workers and workers trained by foreign firms might at one point start working for a local firm.

What are the characteristics of firms that grew particularly fast and what are the implications for policymakers?

### 3. Empirical Analysis

For our empirical analysis we use the World Bank enterprise surveys (WBES) from Malaysia and Thailand (2007), and Indonesia, Lao PDR, the Philippines, and Viet Nam (2009). The surveys are representative samples of registered manufacturing firms with five or more employees. The surveys in Indonesia, the Philippines, and Viet Nam also include firms in the services sector.

#### 3.1 General Enterprise Characteristics

Our sample comprises almost 5,400 firms in six Southeast Asian countries.<sup>9</sup> Note that the employment growth rates and determinants of employment growth need to be interpreted with caution. Our data set is cross-sectional and therefore it includes only the firms that survived throughout until the date of the survey. Hence, all estimates for employment growth should be interpreted as upper bound figures.<sup>10</sup>

Enterprise growth is measured, for the purposes of this paper, by the growth of employment in firms. Measuring firm growth using other indicators such as profits or capital is not possible as these indicators are not measured consistently across countries.

Table 1 summarizes the main characteristics of the enterprises under review. The results show significant employment growth. Firms in our sample started with 64 full-time employees on average and had 114 employees when the surveys were carried out. The median values of the firms' initial and current sizes are considerably lower, with a starting size of 20 employees and a current size of 40 employees. This shows that a small proportion of firms heavily influence the average numbers. The firms in our sample are relatively old: around 16 years on average. The mean and median values of firm age are similar and do not vary substantially across countries.

The orientation toward international markets is somewhat limited: about three-quarters of the output is sold domestically. The data allow us to further distinguish between direct and indirect exports. Directly exporting is the preferred mode, on average only 5% of overall output is exported indirectly through an intermediary, while about 20% is exported directly. Thailand and Malaysia show the highest share of production being exported with an average of 27% and 34%, respectively. We define firms that import inputs and also export as participants in international trade. Using this definition, about 21% of firms participate in international trade.

<sup>9</sup> In order to avoid biased estimation results due to influential outliers, we excluded the top 2% of firms in terms of absolute employment growth. This reduces the sample by about 160 observations.

<sup>10</sup> We examined major enterprise characteristics by firm age. They do not differ substantially across firm age quintiles. This suggests that the bias caused by firms that did not survive might be limited.

Only one-quarter of enterprise owners in our sample are female. The numbers do not vary substantially across countries. About 60% of all enterprise owners have a college degree. Indonesia is the only country where this number is lower than 35%. The average percentage of foreign ownership is roughly 15%. Taken together, the results of Table 1 show that, on average, firms grew, and that a considerable share of firms participates in international trade.

### 3.2 Enterprise Growth and the Role of Initial Firm Size

Table 2 describes this employment growth, applying three different measures. The first two columns of Table 2 show the mean and median values of two employment growth measures used by Mead and Liedholm (1998). The third column shows the average number of jobs that have been created per year since foundation.

Our preferred measure of employment growth is the compounded measure presented in column 2. Average annual growth rates range from 6% (Philippines) to 18% (Thailand). Median values of employment growth are about half of the average values, reflecting heterogeneity across firms. Malaysia is the only country where mean and median employment growth figures are roughly similar, suggesting that the employment growth distribution in Malaysia is relatively close to normal.

Since foundation, the average firm in our sample created about four jobs per year. The countries where the firms grew the fastest also created the most jobs: in Thailand and Viet Nam an average of 10 and six jobs were created, respectively, per firm per year. Meanwhile, the average firm in the Philippines and Lao PDR only created about one job per year.

In sum, Table 2 shows that enterprises in our sample have grown by about 10% since their foundation, but that growth patterns are heterogeneous between and within countries. The next section will examine differences in employment growth across the initial firm size distribution to examine how firms that started as MSEs contributed to employment growth.

#### ***Do MSEs Contribute to Overall Employment Growth?***

Table 3 shows employment growth by initial size quintile.<sup>11</sup> Firms that started in the bottom quintile of the initial size distribution grew by about 21% per year. In contrast, firms in the top quintile of the initial size distribution grew by only 1% per year. Columns 3 and 4 report the absolute number of jobs created by firms in our sample and the relative importance of the respective quintile for overall job creation.

Overall, the firms in our sample created about 260,000 jobs since their foundation. Firms in the bottom quintile of the initial size distribution created about 41,000 jobs and accounted for about 15% of all jobs created. Based on the findings in Table 3, we conclude that firms in the bottom quintile of the initial size distribution contributed considerably to overall employment growth.

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<sup>11</sup> Note that the initial size quintiles are computed by country.

### 3.3 What Role Does Participating in International Trade Play in Employment Growth?

Having confirmed the hypothesis that firms that started small contribute substantially to overall employment growth, we now test the hypothesis that access to imported inputs and/or foreign markets enables firms to exploit economies of scale, thereby boosting employment growth.<sup>12</sup> We use the following model to test this hypothesis:

$$EG_{ij} = \beta_0 + \beta_1 X_{ij} + \beta_2 trade_{ij} + u_{ij} \quad (1)$$

The dependent variable is enterprise growth (EG) in firm  $i$  located in country  $j$ .<sup>13</sup> This is measured using the compounded measure of employment growth:

$$\left[ \left( \frac{\text{current employment}}{\text{initial employment}} \right)^{1/\text{firm age}} \right] - 1 \quad (2)$$

$X_{ij}$  in Equation (1) represents a vector of enterprise and individual characteristics. In particular,  $X_{ij}$  includes the number of full-time employees at enterprise foundation, the percentage of the firm that is owned by a foreign entity, a dummy that takes the value 1 if the enterprise owner is female, a dummy that takes the value 1 if the owner has a college degree, and the firm's age.

To measure the effect of participating in international trade on employment growth we include a dummy that takes the value 1 if a firm exports and also imports inputs.<sup>14</sup> We also use export intensity (direct and indirect exports over sales) as a proxy for participation in international trade to check the robustness of the results. To make the interpretation of the coefficients straightforward, we will use the dummy variable specification when discussing the magnitude of the trade effect. Using different proxies for participation in international trade does not alter the results. Furthermore, we control for heterogeneity across sectors and countries using a set of dummies.<sup>15</sup> Finally,  $u_{ij}$  represents a random error term.

#### **Potential Biases**

It is important to be aware of a number of biases that may affect the estimation results. Measurement error will bias the results downwards and this tendency is likely to be exacerbated by the fact that the dependent variable used is a change over time. The

<sup>12</sup> This hypothesis is supported by the fact that labor productivity is positively related to exporting in our sample.

<sup>13</sup> Although the data are cross-sectional, respondents were asked how many workers were employed in the firm when it was established.

<sup>14</sup> The results are still robust with variations in this definition (e.g., using an exporter dummy) and when omitting explanatory variables such as the size at enterprise foundation.

<sup>15</sup> The following sectors are summarized under other manufacturing: chemicals, auto parts, furniture, office accounting and computing machinery, wood and wood products, non-metallic mineral products, basic metals, fabricated metal products, construction, and transport. The sector dummy for services includes the following sub-sectors: hotels and restaurants, information technology, wholesale, retail, and motor vehicle services.

possibility of reverse causality between participating in international trade and employment growth should also be considered. The model we would like to test is that firms grow because of their participation in international trade, for example, because it allows them to exploit economies of scale. However, it is not implausible that firms are unable to export unless they are already profitable, and therefore growing, so the causality runs from growth to exports, rather than vice versa. If that were the case, our results would be biased upward. However, despite the cross-sectional character of our data set, we know in which year a firm started exporting. The majority of firms for which these data are provided started exporting in the year the enterprise was set up or 1 year later. This lends support to the view that reverse causality is not an issue for our estimation. The fact that most firms export shortly after foundation means that the issue of reverse causality between exporting and employment growth is unlikely to be a serious cause of bias.

However, there is a strong possibility of endogeneity bias, which can make causal interpretation of results, and therefore policy implications, misleading. Endogeneity bias arises because it is difficult to isolate the causal effect of exporting on the employment growth of a firm from the effect of unobserved factors that are correlated with exporting. It is plausible that export status is correlated with unobserved factors such as motivation of the manager. Businesses run by highly motivated managers are likely to expand rapidly, even if they do not succeed in exporting, and the motivated managers will also put more effort into seeking out export opportunities. In this case, an apparently large impact of trade on enterprise growth could, in reality, be largely a reflection of the higher level of motivation among business owners and management.

Similar issues of endogeneity bias have been addressed in empirical studies that examine the effects of participating in international trade on productivity. One remedy is using full information maximum likelihood (Clerides et al. 1998). However, as noted by Bigsten et al. (2004), this approach can be sensitive to the assumptions on the joint error distribution. Another approach is to use matching techniques (de Loecker 2007; Fernandes and Isgut 2005; Girma et al. 2004). The underlying idea behind this technique is to match starting exporters and non-exporters based on propensity score matching to get an idea of how a firm would have performed if it had not started exporting. However, matching approaches are able to eliminate biases based only on observables, not on unobservables. Further, given the cross-sectional nature of our data set it is not possible to use fixed-effects techniques to control for endogeneity.

Therefore, we apply an instrumental variable (IV) approach, adapting the approach by Park et al. (2010) to our data set. The authors use the unforeseen exchange rate shocks in certain countries during the 1997/98 Asian financial crisis as a “natural experiment.” Firms that exported to destination countries such as Thailand experienced heavy demand shocks due to exchange rate variations, whereas companies exporting to Europe, for example, did not experience large shocks. The weighted average real depreciation among a firm’s pre-crisis trade partners, which captures exchange rate shocks, is used as an instrument for the change in exports, in order to isolate the causal effect of exporting on productivity.



While Park et al. (2010) focused on the Asian financial crisis, we exploit the variation in exchange rates caused by the financial and economic crisis that started with the collapse of Lehman Brothers in mid-September 2008. As a consequence of this crisis, exchange rates, especially in the United States (US) and Europe fluctuated. The two most common export destinations for our sample firms are Japan and the US. A significant proportion of firms also export to Europe.<sup>16</sup> As the main export destinations and the proportions received by each vary by firm, exposure to the shocks varies.

The exchange rate shock variable is a suitable instrument if it is strongly related to export intensity, but unrelated to any unobserved factors. The latter is a reasonable assumption, as the exchange rate shocks experienced between 2005 and 2008 were largely unforeseen by firms (and indeed by economic analysts). Further, the firms in the sample had no significant influence over these economic events as the crisis originated in the US (Reinhart and Rogoff 2009).

The first requirement will be met if trade intensity in 2008 is strongly related to the shock variable. This will be the case if firms that experience an exchange rate shock react by reducing the proportion of goods that they export. This is likely to occur if it is easier for them to re-orient sales toward the domestic market than to find new export partners in the short-term. In this case, the firms that experienced the bigger shocks would have lower export intensities than firms that experienced either no shock or a positive change.<sup>17</sup>

Exporting firms in three countries in our data set (Indonesia, the Philippines, and Viet Nam) reported information on their two most important export partners. In line with Park et al. (2010), we compute the exchange rate shock for each destination country  $j$  as follows:

$$ER\_CHANGE_j = \{[\ln(E_{j2008}) - \ln(P_{j2008})] - [\ln(E_{j2005}) - \ln(P_{j2005})]\} \quad (3)$$

In Equation (3),  $E_{jt}$  is the nominal exchange rate (local currency unit per unit of the respective destination country currency) in year  $t$ , and  $P_{j,t}$  is the price level.<sup>18</sup> We follow the approach of Park et al. (2010) and create a firm-level indicator for exchange rate variations by weighting the exchange rate index by the share of sales destined for the respective destination country in 2008. We obtain a firm-level exchange rate index as follows:

$$ER\_SHOCK_i = v_{i,1} * ER\_CHANGE_1 + v_{i,2} * ER\_CHANGE_2 \quad (4)$$

<sup>16</sup> About 40% of firms indicate either Japan or the US as their top export destination, while 10% of all firms report the European Union as their top export destination.

<sup>17</sup> Firms in our data set report exports and the export shares of the two most important destination countries in 2008. Due to contracts negotiated before the crisis that had to be fulfilled there could be some delay in the reaction of exporters. Hence, by using data from only 2008 it could be that we are underestimating the impact of the exchange rate shock on export intensities.

<sup>18</sup> Exchange rate data stem from the United Nations Conference on Trade and Development (UNCTAD) database. Data on consumer price indexes stem from the World Bank World Development Indicators (WDI).

The shares of the destination countries of firm  $i$  are represented by  $v_{i,2}$ . The numbers 1 and 2 represent the two most important export destinations.<sup>19</sup> If a firm only reports the share for the most important destination country, we give that country a weight of 100%. The larger the value of the  $ER\_SHOCK_i$  variable, the larger the increase in the price of exported goods, on average, in the local currencies of the destination countries. *Ceteris paribus*, this would reduce exports. Using a firm-level variable as an instrument has the advantage that we can still include country and sector dummies in the IV estimation.

Only cross-sectional data are available, so we focus on the relationship between the shock and export intensity in 2008, rather than on the change in exports between 2005 and 2008, as in the approach of Park et al. (2010).

It should be noted that using this approach restricts the sample to firms that export, which is around 30% of the sample. As well as reducing the sample size significantly, this means that the equation captures only part of the effect of trade on firm growth. If there is a large benefit to exporting regardless of quantity (a non-linear effect), the IV approach will understate the benefits of exporting, as it is restricted only to those firms that export at least part of their production.<sup>20</sup>

### ***Estimation Results***

The results are reported in Table 4. Columns 1 to 4 report the ordinary least squares (OLS) results. In the first specification we include only the export intensity variable and country and sector dummies, and use data from all six countries in the data set. In column 2 we add all control variables as described above. In the third column we use a dummy that takes the value 1 if a firm exports and also imports inputs as a proxy for participation in international trade. In column 4 we show the results using only data from the three countries that reported information on their export partners. These countries are the ones used in the IV estimates. In column 5 we report the results of the IV estimation, using the weighted exchange rate shock between 2005 and 2008 as an instrument for export intensity. In column 6 we report OLS estimates using the same sample that was used for the IV estimates. We use Viet Nam as the reference country and machinery and equipment as the reference sector.

The first four specifications show highly significant coefficients for the trade variables, which are stable across all specifications. These results are robust for a number of variations in the key variables.<sup>21</sup> Another finding that is robust across all specifications is that firms that started small expand faster, controlling for other factors.<sup>22</sup> The foreign

<sup>19</sup> Among all countries, about 74% of exports go to the two most important export destinations. Hence, the data constraint of having only data on the two most important export destinations is not critical for our analysis.

<sup>20</sup> Note that the information on export destination shares is very noisy. Only half of all exporters report consistent information on destination countries and/or their shares of exports.

<sup>21</sup> The results remain stable when running the regression by size and age groups, and alternative definitions of employment growth (e.g., absolute growth of employment or a log specification of employment growth).

<sup>22</sup> The sign and magnitude of the age variable is in line with other studies such as Dinh et al. (2010) and Wignaraja (2012). One possible explanation for this result is that younger firms find it easier to adapt to

ownership variable is significant and positive in models 2, 3, and 4. The coefficient is positive and of similar magnitude in all other specifications. The coefficient on the gender of the enterprise owner is negative in most specifications, and is significant for the sample used in the IV specification (only exporting firms).<sup>23</sup> The level of education of the owner seems to matter too as the dummy education variable is positive and significant in all specifications.

Including control variables leads to a considerable increase in the adjusted R-squared, but has little effect on the trade variables. The estimates from the six-country sample are of similar magnitude as the results using the three-country sample.

As could be expected from the descriptive statistics, the Thailand dummy (not reported) is significant and positive. The other country dummies show that after controlling for individual and enterprise characteristics, employment growth was significantly lower in Indonesia and the Philippines than in Viet Nam. Firms in the electronics sector show the highest growth rates after controlling for country effects and individual and enterprise characteristics.

However, as described above, these results should be interpreted with caution because of the strong possibility that they are affected by endogeneity bias. Therefore, in column 5 we introduce the instrumental variable approach described above. We report the second stage IV estimates in column 5. The first stage estimates show the expected negative and highly significant (t-value of  $-2.61$ ) relationship between export intensity and our exchange rate shock index (see Appendix for the complete results).

The null hypothesis of under-identification is rejected at the 5% confidence level.<sup>24</sup> However, an F Test of whether all excluded instruments are significant suggests that the instrument may be weak. This test in our data set has an F-value of 6.8. According to the thresholds defined in Stock et al. (2002), this means that the null hypothesis (the instrument is insignificant) can be rejected only at the 20% level.<sup>25</sup>

As explained by Stock et al. (2002), the presence of weak instruments leads to unreliable point estimates and confidence intervals. This means that the IV estimates should be interpreted with caution, and is likely to explain the fact that the IV specification provides only weak evidence for the impact of trade on employment growth. Neither specification shows a significant coefficient for trade intensity. However, the fact that the coefficient does not change signs and remains of a similar magnitude is encouraging. Large swings in the coefficient and implausible magnitudes are common characteristics of very weak instruments. The first stage results indicate that the exchange rate shocks did affect trade intensity, supporting the appropriateness of this

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new and more efficient production technologies, which enables them to grow faster. We also detected some evidence of a non-linear age effect when including age squared in the specification.

<sup>23</sup> This indicates that export firms headed by female entrepreneurs face particular barriers to employment growth. Further investigation would be needed to identify the reasons for this finding.

<sup>24</sup> See Baum et al. (2003) for details. In the case of one endogenous regressor and one instrument, the null hypothesis of this test is that the correlation matrix between this regressor and the instrument is nonzero.

<sup>25</sup> The results do not change when using Tobit estimation techniques in the first stage regression or when using the exchange rate shock between 2006 and 2008.

instrument. Another factor behind the lack of a significant result in the IV specification is that the data on export destinations and export shares are very noisy, so many observations need to be dropped, resulting in a small sample size.

Taken together, the evidence suggests, subject to the potential biases mentioned above, that participating in international trade raises employment growth. After controlling for sector and country effects as well as differences in firm and individual characteristics, employment growth in firms that export and import inputs was about 3% higher compared with all remaining firms. The results are robust for variations in the trade variable and also for variations in the countries included.<sup>26</sup>

### 3.4 Who are the Top Performers in Terms of Employment Growth?

#### *Firm Characteristics*

In order to derive suggestions for policy measures, we now examine the characteristics of the firms that have grown the most since their foundation. We define top performers as enterprises in the top quintile of enterprise growth. Table 5 shows differences in firm and individual characteristics between top performers and all remaining firms.

Overall, the results show that top performers and the remaining firms differ significantly in all categories except for the education of the owner and the percentage of female owners.<sup>27</sup> About one-quarter of top performers are participating in international trade, compared with one-fifth of firms that are not defined as top performers. Also top performers started significantly smaller, which is in line with the findings of Tables 3 and 4. Again, the median values for initial size are smaller than mean values, reflecting the skewed initial size distribution. The results also show that one-third of top performing firms started as MSEs with fewer than five employees. In addition, top performers are on average about 10 years younger. This may reflect higher capacity to adopt new technologies that increase productivity. However, this effect may also be caused by firms closing down if they did not grow fast enough.

For top performers the experience of the owner exceeds the firm age, on average, whereas for the other firms the firm age exceeds the years of experience of the owner. So even if one assumes that the owner has worked in a top-performing enterprise since its foundation, she would have had on average about 3 years of experience when founding the company. For the remaining firms it could be that the recent owner who has less years of experience than the firm age took over the business from a family member. Such enterprises might find it harder to adopt new production technologies. The percentage of firms whose owner have a college degree or are female do not vary significantly between top performers and other firms. Finally, top performers have a significantly higher percentage of foreign ownership. This is plausible since being part of an international company may facilitate intra-firm knowledge spillovers.

<sup>26</sup> We ran separate regressions including only Malaysia and Thailand, and regressions including only Indonesia, Lao PDR, the Philippines, and Viet Nam. The main findings were not altered.

<sup>27</sup> The results are based on a T test assuming unequal differences between the groups.

To learn more about the relative importance of the determinants of being a top performer we run a probit model of the following form:

$$Top\ performer_{ij} = \beta_0 + \beta_1 X_{ij} + sector\ dummies + country\ dummies + \varepsilon_{ij} \quad (5)$$

The dependent variable in Equation (5) is a dummy that takes the value 1 if firm  $i$  in country  $j$  is a top performer. The vector  $X$  includes the control variables that were used in Table 5. The coefficients and marginal effects from estimating (5) are reported in Table 6. The pseudo R-squared shows that the chosen indicators are able to explain a substantial part of whether or not firms are top performers. The results show that the gender and expertise of the owner do not significantly influence the likelihood of being a top performer.

Initial firm size and the percentage of foreign ownership show significant marginal effects, although the coefficients are very small. Furthermore, the results show that younger firms are more likely to be top performers. Since top performers and other firms do not differ substantially in terms of the owner's education, the positive and significant coefficient on the college dummy is unexpected. However, this effect only occurs when we also control for firm age. Hence, the reason for the change of significance in the education variable is that more educated persons tend to be owners of older firms. This means that not considering firm age hides the effect of education. After controlling for firm age, having a college degree increases the probability of being a top performer by roughly 5%. The marginal effect of participating in international trade is even bigger. The results show that participating in international trade increases the probability of being in the top quintile of employment growth by about 10%.

The country dummies show that, *ceteris paribus*, the probability of being a top performer is highest in Malaysia, which was chosen as the reference category. This result may be driven by the rapidly expanding rubber sector in Malaysia.<sup>28</sup> The results from the sector dummies show that being in the machinery or services sector significantly lowers the probability of being a top performer. These findings need to be interpreted with caution as the hypothesis that the sector dummies are jointly zero can only be rejected at the 5% confidence level, according to a joint F test.

The marginal effect estimates should also be interpreted with caution. The potential issues of reverse causality and unobserved heterogeneity discussed in the context of Table 4 apply also to the results presented in Table 6. In addition, our data set only includes firms that survived until the date of the survey. Not accounting for unsuccessful business ventures biases our result upwards. Nonetheless, the findings that education and participating in trade substantially increase the probability of being a top performer are both interesting and relevant for policymakers in Asia.

<sup>28</sup> The results reported in Table 7 show that about one-fourth of top performing firms in Thailand and Malaysia can be found in the rubber sector.

### ***Sectoral Distribution of Top Performers***

To design targeted policies to foster employment growth it is also important to know which sectors are home to successful entrepreneurs. To examine the sectoral division of top performers, **Table 7** shows the percentage of top performers by country group and sector. Sector definitions are identical in Indonesia, the Philippines, and Viet Nam, and very similar in Thailand and Malaysia. Therefore, we present the findings by country group.<sup>29</sup>

In Table 7 we sorted the sectors in descending order according to the percentage of top performers. The concentration of top performers is highest in Indonesia, the Philippines, and Viet Nam, where about 20% of all sectors include 50% of all top performers. In Malaysia and Thailand about 30% of all sectors account for 50% of the top performers. Note, however, that one-fourth of top performing firms are in the rubber sector in Malaysia and Thailand. Garment and food processing are among the top five sectors in both country groups. However, the share of top performers in high technology industries such as electronics is about 13% in Thailand and Malaysia. This is almost twice as high as in Indonesia, the Philippines, and Viet Nam.

## **4. Conclusion and Policy Outlook**

The motivation for this paper stems from the empirical observation that despite the severe constraints faced by MSEs in developing countries, an important number of them have the potential to grow (Grimm et al. 2012). In particular, we examine the role of participating in international trade in employment growth. Using firm-level data from World Bank Enterprise Surveys in Indonesia, Lao PDR, Malaysia, Thailand, the Philippines, and Viet Nam, we examine the following questions:

***Can we observe employment growth in MSEs? If so, do firms that started small contribute to overall employment growth?***

Using a compounded measure of employment growth, we find that firms in the bottom quintile of the initial size distribution grew on average by 20% per annum, which is significantly higher than the overall average employment growth rate of about 10%. Our results also show that 15% of all jobs created by firms in our sample were created by firms in the bottom quintile of the initial size distribution. Based on these results, we conclude that firms that started small contributed considerably to overall employment growth.

***How does participating in international trade contribute to employment growth?***

We find that after controlling for firm and individual characteristics, firms that export and also import inputs grew on average 3% faster per year than all remaining firms after controlling for country, sector, and individual characteristics.

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<sup>29</sup> The data on Lao PDR only distinguishes between services and manufacturing. The top performers are approximately evenly distributed between the two groups.

These results need to be interpreted with caution as the sample only includes firms that survived until the date of the survey. Not controlling for unsuccessful firms biases our results upward. Furthermore, given the variables included in our data set, we cannot rule out the issue of endogeneity between participating in international trade and employment growth. However, the fact that firms start exporting quickly after their foundation lends support to the hypothesis that participating in international trade causes employment growth and not vice versa. The results of the IV estimation do not show a significant effect of trade on employment growth, possibly because the only available instrument is somewhat weak. However, they provide no evidence to suggest that endogeneity is driving the relationship. Also, the first stage estimation results are very similar to Park et al. (2010) who successfully use exchange rate fluctuations during the 1997/98 Asian financial crisis as an instrument. Further investigation using this IV approach with a larger sample and more precise data could be fruitful. Our findings are in line with other studies, such as Dinh et al. (2010), and support the hypothesis that participating in international trade boosts employment growth.

### ***What are the characteristics of firms that grew particularly fast?***

We define top performing firms as firms in the top quintile of the employment growth distribution. The results show the high potential of MSEs, as one-third of top performing enterprises started with fewer than five employees. Using probit estimates, we show that in addition to participating in international trade, which is associated with a 10% boost in the likelihood of being a top performer, the education level of the enterprise owner matters. After controlling for country, sector, and other individual and firm characteristics, the results show that the owner having a college degree increases the likelihood of being a top performer by 5%. In addition to education of the owner and participating in trade, younger firms have a higher probability of being top performers.

### ***What does this mean for policymakers?***

The finding that MSEs and participating in international trade play an important role in employment growth suggests that policymakers could boost job creation by making it easier for firms to plug into international trade networks. A number of measures could be considered, such as simplification of customs procedures for MSEs or small export volumes, provision of information on customs procedures, or the offering of export credit or guarantee products designed to be accessible to MSEs.

Given the finding that the education level of a firm's owner increases employment growth, these sorts of measures are likely to be most effective if they are combined with training. Training could cover issues such as the regulations and norms that are necessary to participate in international trade (e.g., quality standards for exports or import regulations to obtain raw materials that cannot be sourced domestically). The findings also suggest that entrepreneurs who are already educated and have some experience are more likely to initiate successful enterprises and may therefore be more likely to benefit from training. Hence, training and information campaigns could be most effective if they are targeted at persons with a certain minimum level of education.

The finding that most firms start exporting relatively quickly after their establishment also has policy implications. Advice and training on how to plug into international trade networks should be available to potential entrepreneurs even before the establishment of an enterprise.

We observe that only one-quarter of all entrepreneurs in our sample are female. This may reflect the fact that due to social norms potentially talented female entrepreneurs lack the opportunity to establish enterprises. Overall, the data do not allow us to make specific recommendations for targeting either male or female entrepreneurs, but access to training or other interventions should certainly be open to both genders.

Our results on the question of which sectors are promising are not conclusive. In general, the targeting of specific gender groups and sectors needs to be decided on a case-by-case basis and rely on a detailed analysis of the national context.



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**Table 1: General Enterprise Characteristics**

Country		Firm size (full-time employees)	Initial firm size (full-time employees)	Output sold domestically (%)	Output exported directly (%)	Output exported indirectly (%)	Firms that import inputs and export (%)	Female owner	Owner with college degree (%)	Firm age (years)	Foreign ownership (%)
Philippines	mean	78.72	58.16	80.94%	13.67%	5.40%	15.75%	29.20%	89.20%	17.57	18.52%
	N	1130	1130	1130	1130	1130	1130	1130	1130	1130	1130
Indonesia	mean	88.86	51.99	91.04%	6.89%	2.08%	7.16%	25.84%	32.71%	16.61338	5.82%
	N	1076	1076	1076	1076	1076	1076	1076	1076	1076	1070
Viet Nam	mean	143.10	109.59	71.68%	19.96%	8.36%	23.05%	21.61%	66.43%	10.27	13.26%
	N	694	694	694	694	694	694	694	694	694	694
Thailand	mean	161.34	71.94	73.29%	23.81%	2.90%	29.71%	33.09%	69.26%	14.02	21.31%
	N	976	976	976	976	976	976	976	976	976	619
Malaysia	mean	129.54	48.84	66.46%	28.82%	4.72%	36.53%	8.82%	43.51%	18.98	21.47%
	N	1032	1032	1032	1032	1032	1032	1032	1032	1032	1031
Lao PDR	mean	64.04	44.46	80.94%	9.17%	9.89%	9.69%	37.89%	42.74%	10.86	14.20%
	N	351	351	351	351	351	351	351	351	351	350
Total	mean	113.62	63.50	77.52%	17.67%	4.81%	21.22%	24.81%	58.87%	15.58	15.66%
	N	5259	5259	5259	5259	5259	5259	5259	5259	5259	4894

Note: To correct for outliers we excluded the top 2% of firms that showed the largest increase in full-time employees.

Source: Author's computations based on WBES.

**Table 2: Employment Growth in Developing Asia**

Country		Average annual growth rate (simple averages)	Average annual growth rate (compounded)	Average no. of added workers per enterprise per year
Philippines	mean	18.80%	5.77%	0.78
	median	3.52%	2.58%	0.36
	N	1130	1130	1130
Indonesia	mean	19.17%	8.77%	2.43
	median	6.10%	4.14%	0.33
	N	1076	1076	1076
Viet Nam	mean	30.42%	11.85%	6.27
	median	6.67%	5.20%	1.97
	N	694	694	694
Thailand	mean	51.92%	18.13%	9.76
	median	20.00%	9.46%	4.27
	N	976	976	976
Malaysia	mean	28.72%	8.24%	5.11
	median	10.61%	5.89%	1.76
	N	1032	1032	1032
Lao PDR	mean	23.80%	7.97%	1.40
	median	5.56%	4.01%	0.37
	N	351	351	351
Total	mean	28.84%	10.11%	4.40
	median	8.00%	5.14%	1.10
	N	5259	5259	5259

Notes:

1. Average annual growth rate (simple averages) is defined as  

$$[(current\ employment - initial\ employment) / (initial\ employment)] / (firm\ age)$$
2. Average annual growth rate (compound) is defined as  

$$[(current\ employment / (initial\ employment))^{1/(firm\ age)}] - 1$$

Source: Author's computations based on WBES.

**Table 3: Employment Growth by Initial Size Quintiles**

Quintile of initial size distribution	Average annual growth rate (simple averages)	Average annual growth rate (compounded)	Jobs created (absolute)	Percentage of jobs created
First	62.70%	20.58%	40,773	15.47%
Second	28.85%	11.49%	36,385	13.80%
Third	21.08%	7.61%	51,267	19.45%
Fourth	15.35%	6.26%	78,299	29.71%
Fifth	5.53%	1.46%	56,852	21.57%
<b>Total</b>	<b>28.84%</b>	<b>10.11%</b>	<b>263,576</b>	<b>100.00%</b>

Notes:

1. Average annual growth rate (simple averages) is defined as  

$$[(current\ employment - initial\ employment) / (initial\ employment)] / (firm\ age)$$
  2. Average annual growth rate (compound) is defined as  

$$[(current\ employment / (initial\ employment))^{(1/(firm\ age))}] - 1$$
- Quintiles computed by country.

Source: Author's computations based on WBES.



Table 4: The Role of Trade for Employment Growth—OLS Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Methodology	OLS	OLS	OLS	OLS	OLS	IV	OLS
Export intensity	0.0110** (0.0053)	0.0211*** (0.0054)		0.0185*** (0.0041)	0.0313*** (0.0093)	0.0638 (0.1089)	0.0187 (0.0177)
Trade dummy			0.0302*** (0.0047)				
Size at foundation		-0.0002*** (0.0000)	-0.0002*** (0.0000)	-0.0001*** (0.0000)	-0.0001*** (0.0000)	-0.0001*** (0.0000)	-0.0001*** (0.0000)
foreign ownership, %		0.0002*** (0.0001)	0.0002*** (0.0001)	0.0002*** (0.0000)	0.0001 (0.0001)	0.0002 (0.0002)	0.0002 (0.0002)
College		0.0149*** (0.0039)	0.0127** (0.0039)	0.0112*** (0.0031)	0.0117*** (0.0059)	0.0387* (0.0205)	0.0371* (0.0204)
Firm age		-0.0025*** (0.0002)	-0.0025*** (0.0001)	-0.0019*** (0.0001)	-0.0019*** (0.0002)	-0.0017** (0.0008)	-0.0020*** (0.0006)
Female GM		-0.0036 (0.0042)	-0.0026 (0.0042)	-0.0025 (0.0032)	0.0041 (0.0055)	-0.0362** (0.0150)	-0.0344** (0.0144)
Constant	0.0752*** (0.0082)	0.1092*** (0.0083)	0.1083*** (0.0082)	0.0888*** (0.0060)	0.0752*** (0.0098)	0.0458 (0.0725)	0.0668* (0.0370)
Country dummies	yes	yes	yes	yes	yes	yes	yes
Sector dummies	yes	yes	yes	yes	yes	yes	yes
Test for under identification (p-value)						0.0018	
Test for weak identification (F statistic)						6.8140	
N	5327	4933	4930	4843	2679	308	308
Adjusted R-squared	0.0506	0.1404	0.1442	0.1634	0.0774	0.1368	0.1505

Notes:

1. Robust standard errors in parentheses.

2.  $p < 0.10$ ,  $**p < 0.05$ ,  $***p < 0.01$ .

3. In all regressions, we drop influential outliers from our sample that we identify by the DFITS-statistic. As suggested by Belsley et al. (1980), we use a cutoff-value  $|DFITS_{ij}| > 2\sqrt{N/k}$  with  $k$ , the degrees of freedom (plus 1) and  $N$ , the number of observations. Export intensity: sales/exports. Instrument used: In of weighted exchange rate shock of the two most important export destinations. Source: UNCTAD (2013) and World Bank (2013) for exchange rate and CPI data, and author's computations based on WBES.

Table 5: Characteristics of Top Performers

	Participating in international trade (%)	Initial firm size	% Firms started was MSE (fewer than 5 employees)	Firm age	GM expertise	Owner has college degree (%)	Female GM (%)	Foreign ownership (%)
Top performers	mean	22.55	27.32%	8.47	11.04	59.98%	25.41%	20.76%
	median	10	0	7	9	1	0	0
	N	1047	1047	1047	1015	1047	1047	974
Remaining firms	mean	73.68	9.45%	17.35	14.27	58.59%	24.67%	14.40%
	median	20	0	15	12	1	0	0
	N	4212	4212	4212	4101	4212	4212	3920
T test result	***	***	***	***	***	***		***
Total	Mean	63.50	13.01%	15.58	13.63	58.87%	24.81%	15.66%
	Median	20	0	13	11	1	0	0
	N	5259	5259	5259	5116	5259	5259	4894

Note: \* p<0.10, \*\*p<0.05, \*\*\* p<0.01 of T test assuming unequal variances between groups testing hypothesis that the group means are equal.

Source: Author's computations based on WBES.

**Table 6: Probit Estimates—Dependent Variable: Being a Top Performer**

	(1) Probit	(2) Marginal Effects
Participation in international trade	0.4325*** (0.0688)	0.0941*** (0.0147)
Firm size at foundation	-0.0072*** (0.0011)	-0.0016*** (0.0008)
Firms age	-0.0917*** (0.0045)	-0.0200*** (0.0008)
GM expertise	0.0028 (0.0030)	0.0006 (0.0006)
Owner has college degree	0.2426*** (0.0600)	0.0528*** (0.0129)
Female GM	-0.0701 (0.0569)	-0.0152 (0.0124)
% of foreign ownership	0.0021*** (0.0008)	0.0004** (0.0002)
Constant	0.5227*** (0.1007)	
Country dummies	yes	yes
Sector dummies	yes	yes
N	4751	4751
Pseudo R-Squared	0.2261	

Note: Robust standard errors in parentheses.

Source: Author's computations based on WBES.

Table 7: Top Performers by Sector

Rank	Indonesia, Philippines, and Viet Nam		Malaysia and Thailand	
	Sector	% of top performers	Sector	% of top performers
1	Garments	14.70	Rubber	23.44
2	Food processing	14.53	Electronics	13.40
3	Non metallic mineral products	11.66	Food processing	12.92
4	Textiles	10.64	Furniture	11.96
5	Other manufacturing	9.97	Garments	9.81
6	Rubber	9.12	Automobile and parts	9.57
7	Chemicals	8.45	Machinery	7.18
8	Electrical machinery and apparatus	6.25	Textiles	6.22
9	Retail	4.73	Chemicals	3.59
10	Fabricated metal products	4.56	Wood and wood products	1.20
11	IT	1.18	Office accounting and computing machine	0.72
12	Machinery	1.01		
13	Basic metals	0.84		
14	Transport	0.84		
15	Construction	0.68		
16	Wholesale	0.51		
17	Services of motor vehicles	0.17		
18	Hotel and restaurants	0.17		
Total		100.00		100.00

Source: Author's computations based on WBES.

## Appendix

**Table A1: First Stage Estimation Results**

<b>Dependent Variable: Export intensity</b>	
Exchange rate shock	-0.684** (0.262)
Size at foundation	0.000 (0.000)
Foreign ownership, %	0.001 (0.000)
College	-0.049 (0.057)
Firm age	-0.005* (0.002)
Female GM	0.043 (0.041)
Constant	0.622*** (0.097)
Country dummies	yes
Sector dummies	yes
R-squared	0.196
N	308

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Source: Author's computations based on WBES.

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