POLICY NOTE 5

73126

Productivity Performance in Indonesia's Manufacturing Sector

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Printed in September 2012

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Abstract

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Relying on firm-level data from Statistik Industri this note analyzes the evolution of productivity dynamics of Indonesian firms over the past 20 years (1990-2009). Economy-wide and sectoral productivity changes are decomposed into their two main components: changes due to the evolution of average productivity and changes due to "allocative efficiency". This decomposition shows that while during the 20 years both components have increased, the changes in allocative efficiency have been mainly driven by average productivity growth and less by increases in allocative efficiency, even if the latter has also improved during the period under analysis. Interestingly, the note shows that both average TFP growth and allocative efficiency improvements are especially driven by a few sectors: electronics, machinery and instruments, and textiles, clothing and footwear. Limited improvements in both allocative efficiency and average TFP have occurred instead in natural-resource-based sectors — sectors characterized by more limited competition and higher rents. This note emphasizes the importance of "allocative efficiency" for productivity evolution because, in a context where firms are very different in their productivity, it becomes crucial how resources are allocated in the economy. This series of policy notes suggests that regulatory reforms, exposure to foreign competition and access to imported intermediate inputs are important determinants of allocative efficiency. The problem of a "missing middle" is closely related to that of sub-optimal allocation of resources across firms: a strong feature of Indonesian firm-size distribution. Going further, the note suggests that burdensome regulations and imperfect financial markets are two important causes of this missing middle. To complement the focus on productivity, the note also analyzes firm-level job dynamics and points to the crucial role of "start-ups" and new companies as a key driver of job creation. This finding suggests that the focus of policymakers on SMEs may be misplaced and that this focus should start realigning towards supporting more dynamic "start-ups" rather than SMEs.

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1. Introduction

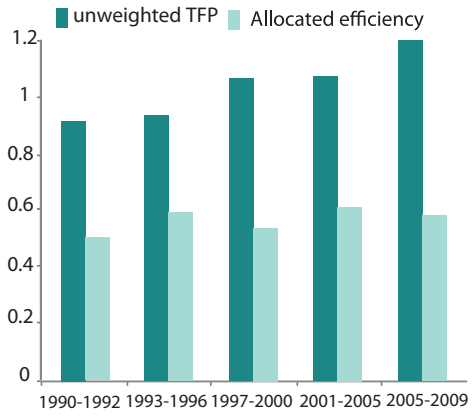
This note focuses on the productivity performance of Indonesia's manufacturing sector since the early 1990s. There are several determinants of aggregate productivity performance. This note focuses on three: (i) micro-level productivity; (ii) allocative efficiency; and (iii) distortions in the distribution of firms' size. In Section 2, the note describes the development of total factor productivity (TFP) for Indonesian manufacturing plants over the past 20 years. In Section 3, the note studies allocative efficiency in the Indonesian manufacturing sector, i.e. the degree to which resources are reallocated towards more productive firms. Since distortions in firm size and the allocation of resources across different firm-size groups have major implications for overall productivity growth, this note examines the distribution of firms by size group in Section 4. Section 5 therefore focuses on wages and employment in Indonesia's manufacturing sector, while Section 6 concludes.[1]

Throughout this note, the analysis outlines the role of firms'[2]characteristics in affecting micro-level productivity, allocative efficiency, wages and employment. Understanding the role of firm heterogeneity (i.e., differences in characteristics and performance) in Indonesia's manufacturing sector is important from a policy perspective. Empirical evidence suggests that firms — even within a narrow sector category — differ in terms of their characteristics, and theoretical models have increasingly started to acknowledge this fact (e.g., Melitz, 2003). Firm heterogeneity determines, for instance, how firms respond to external changes, including competition, trade openness, regulations, and the macroeconomic environment.

2. Total Factor Productivity

Total factor productivity in Indonesian manufacturing increased over the period 1990-2009. Part of the reported increase in TFP in the manufacturing sector can be related to improvements in average plant-level efficiency that are internal to firms, implying that, on average, plants became slightly more productive. Figure 1 shows that the unweighted average TFP index increased over the period 1990-2009, and by 2009 there had been a 20 percent cumulative increase in average TFP. Another part can be related to gains in allocative efficiency, implying that, to some extent, resources were reallocated away from less productive into more productive plants (see Box 1 for a definition and relevance of allocative efficiency). Allocative efficiency has somewhat improved over time, especially after the Asian financial crisis (Figure 1), but shows a slight decline in the period 2005-09.

Figure 1: Total factor productivity and allocative efficiency, 1990-2009



Note: The vertical axis measures the covariance term as defined in the productivity decomposition by Olley and Pakes (1996). For more details see Box 1.

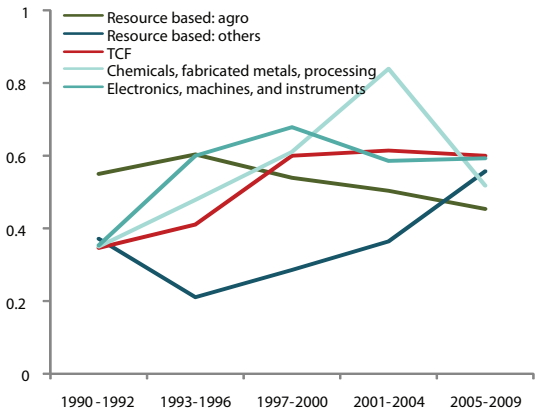
Both TFP growth and allocative efficiency evolution during the period 1990-2010 were different across sectors. By breaking down the overall manufacturing TFP evolution by sectors we find that the trends in the evolution of TFP and allocative efficiency are very different across sectors. With

[1] The analysis relies on medium and large plants based on the annual Indonesian Manufacturing Census.

[2] In this policy note we use the terms "firm" and "plant" interchangeably even if the data on which the analysis is based, the Statistik Industri, focus on plants as its unit of analysis.

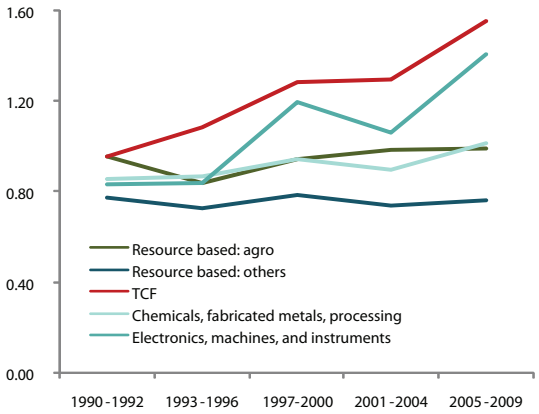
respect to TFP, two sectors were characterized by especially high growth: electronics, machinery and instruments on the one hand, and textiles, clothing and footwear on the other. Interestingly, both sectors were characterized by sustained exposure to and integration with the global economy, both through direct competition with other producers and through foreign direct investment (FDI) entering in Indonesia. Conversely, resource-based sectors, in particular non-agricultural ones, were instead characterized by nearly flat TFP evolution. These sectors tend to be characterized by very high rents and advantages due to natural endowments. This may explain why incentives to innovate and increase TFP are limited, given that profitability is assured by the rents. Reinforcing these patterns, it is interesting to notice that the same sectors characterized by high average TFP growth were also characterized by improving allocative efficiency, while those sectors characterized by sluggish TFP growth (i.e., natural resource sectors) were also characterized by a disappointing evolution in terms of allocative efficiency.

Figure 2: TFP evolution by sector



Source: World Bank staff calculations based on BPS data.

Figure 3: Allocative efficiency evolution by sector



Source: World Bank staff calculations based on BPS data.

Box 1: Allocative efficiency – What is it and why does it matter?

What it is

Allocative efficiency can be defined as the extent to which the economy is able to channel resources towards the most efficient firms.

Why it matters

If all firms had the same productivity level, allocative efficiency would not matter at all. However, increasingly, micro-level studies have pointed towards a substantial persistence of productivity heterogeneity between firms that manufacture similar products. In such a context, the extent to which the market is able to shift resources towards more productive companies is a crucial determinant of the overall productivity level, as well as productivity growth.

How to measure it

The common way to measure allocative efficiency is by answering a simple question: are resources allocated efficiently in a sector? To answer this question researchers rely on a cross-sectional decomposition proposed by Olley and Pakes (1996). Aggregate sectoral productivity is decomposed into two components: (a) average (unweighted) sectoral productivity, (b) cross-term reflecting the cross-sectional efficiency of allocation of activity. Where P_S is the sectoral productivity, Ns the number of firms in sector "s", pi is the productivity of firm "i" belonging to sector "s", (ps) is unweighted sectoral productivity, (ωs) is the average number of workers in the sector, ωi the number of workers of firm "i".

$$Ps = 1/N_s \sum_{ies} pi + \sum_{ies} (p_i - p_s)(\omega_i - \omega_s)$$

The cross-term captures the allocative efficiency and its contribution to the overall sectoral productivity. The measure is positive and larger if firms with above average productivity tend to employ more workers than the average firm. If, instead, less efficient firms tend to employ more workers than more efficient ones, the term is smaller or even negative.

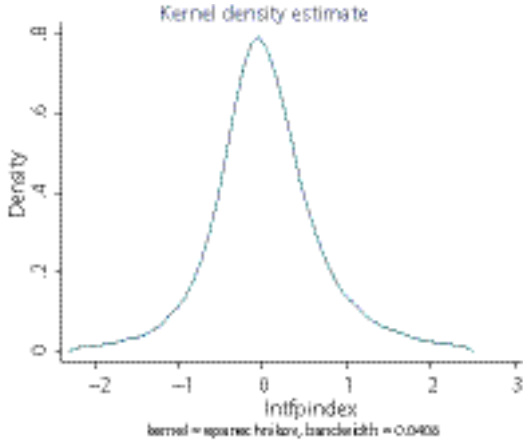
Source: Arnold, Nicoletti and Scarpetta (2008), Bartelsman, Haltiwanger and Scarpetta (2007), Olley and Pakes (1996).

Manufacturers are heterogeneous in terms of their productivity. As in many other countries, Indonesia's manufacturing sector is characterized by substantial heterogeneity in terms of TFP across plants belonging to the same 5-digit sector, as shown in Figure 4.[3] The differences in productivity between the top and the bottom decile within the same sector can reach 400 percent. The average spread is 140 percent but in a quarter of the sectors it is larger than 200 percent, and in one tenth of the sectors it exceeds 280 percent.

The finding that producers with very different productivity levels coexist within narrowly defined sectors is not surprising. For instance, in the year 2000 the spread between the 90th and 10th percentile of productivity distribution in the UK was on average 150 percent.[4] Even more striking is the finding of Dutz (2007) who documented a productivity spread of 500 percent between the most productive companies and the average firm in India. Similarly, Hsieh and Klenow (2009) find a TFP spread of 5:1 between top and bottom 10 percent of firms in India.

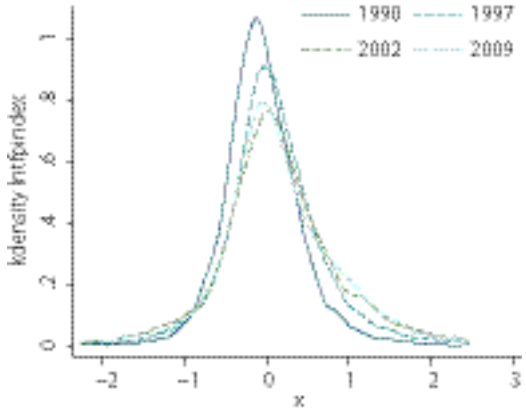
While the average plant productivity in Indonesia has increased since 1990, it has also been accompanied by an increase in productivity dispersion. Figure 5 below presents the distribution of productivity for various years between 1990 and 2008. It shows that the distribution of TFP has been shifting to the right and its tails have become fatter, revealing that the proportion of plants with extreme levels of productivity (both high and low) increased. These findings suggest that there could be institutional or market constraints that prevent plants from improving their performance.

Figure 4: TFP dispersion in 2009. Plants with very different productivity levels coexist within narrowly defined sectors



Source: WB estimates from the manufacturing census

Figure 5: Kernel density estimate of TFP for different years. TFP shows a higher dispersion in more recent years

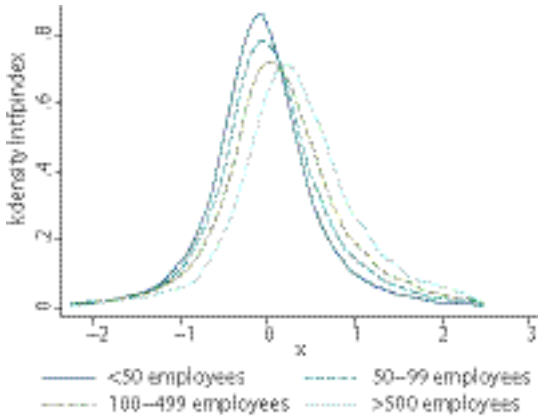


Source: WB estimates from the manufacturing census.

[3] Sector is defined at the 5-digit level on the basis of the ISIC rev. 3 classification. Total factor productivity (TFP) is measured using a multilateral index calculated following Aw, Chen and Roberts (2001). This index is an extension of the multilateral TFP index derived by Caves et al. (1982). It allows for consistent comparison of TFP in plant-level data with a panel structure. To guarantee that comparisons between any two plant-year observations are transitive, the index expresses each individual plant's output and inputs (capital, labor, materials and energy) as deviations from a single reference point. As the reference point, the index uses a hypothetical plant operating in the base time period (the first year of the data 1983) and having average input costs shares, average logarithm of inputs and average logarithm of output. The index is calculated separately for each 4-digit ISIC sector.

[4] Haskel and Martin (2002).

Figure 6: Plant size and plant productivity



Source: WB estimates from the manufacturing census.

Several plant-level characteristics, such as plant size, are positively correlated with productivity. In a well-functioning economy, firm size and productivity are positively correlated. Such a positive relationship is also visible in Indonesia, as illustrated in Figure 6. Given the large differences in productivity it is desirable for more productive plants to hire more labor and capital and expand their production. While on average there is a clear productivity difference between producers of different sizes, the graph below also shows a substantial overlap across the different size groups.

Importers and exporters as well as foreign-owned plants, tend to exhibit not only higher productivity levels, but also higher productivity growth. Producers that are more integrated with the global economy both by exporting a larger part of their output or by using imported materials tend to be on average 16-17 percent more productive than non-integrated plants. Foreign-owned plants have a productivity advantage of 28 percent over their domestic counterparts (Figure 7). More importantly, more integrated producers tend to enjoy faster productivity growth (Figure 8).

Figure 7: Productivity premia

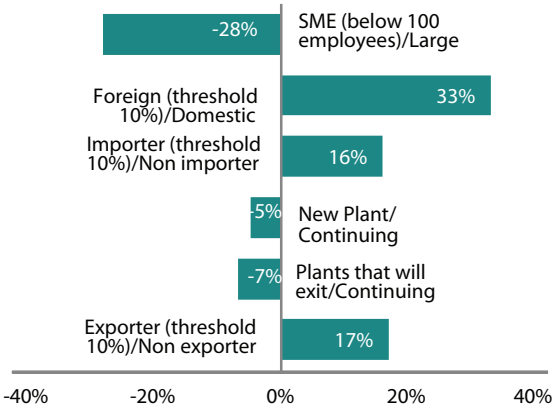
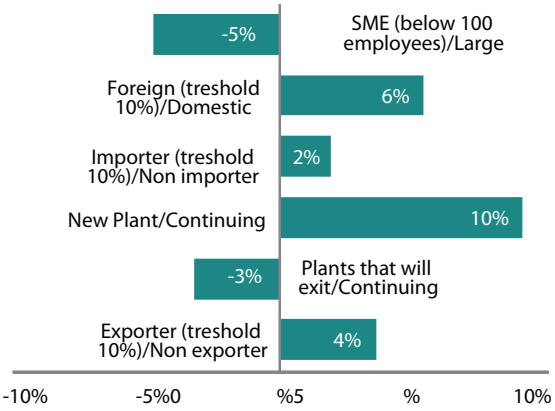


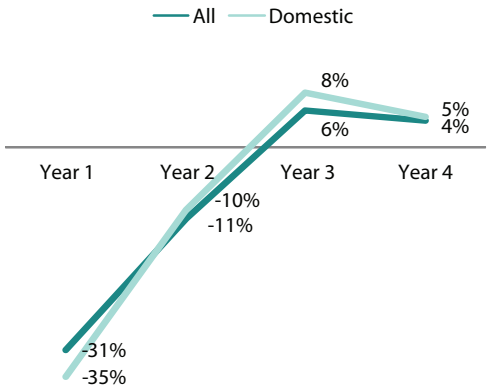
Figure 8: Productivity growth premia



Note: Foreign plants are those that have at least 10 percent of foreign ownership; importer/exporter are plants that respectively import/export at least 10 percent of their output; exiting plants are those that will stop producing during the coming two years; and new plants are those that have been created in the past three years. These premia are averages for the period 1990-2009.

New entrants are on average less productive but those new entrants that survive more than one year contribute to both job and productivity growth. In fact, although initially smaller, start-ups are the most dynamic producers. New entrants tend to be less productive than incumbents in the year of their establishment. However, they enjoy faster productivity growth during the first three years after their creation than other producers (conditional on survival). This is particularly the case for domestic producers, driving overall results for all producers. It is even true when controlling for industry affiliation and time period (Figure 9). Moreover, as shown by Figure 9, during the first three years of their operation the productivity growth premium of new entrants is about 8 percent.

Figure 9: Productivity start-up companies
(relative to incumbents)



Source: World Bank staff calculations based on BPS data.

Start-ups are not concentrated in just a few sectors. Given the importance of start-ups for the reasons just discussed, it is interesting to notice that while there is heterogeneity in terms of their sectoral distribution, start-ups are not concentrated in just a few sectors. On the contrary, on average 6 percent of all manufacturing companies in 2008 were start-ups and in more than half of the 2-digit sectors the share of start-ups is 6 percent or higher.

Despite existing distortions, market forces seem to operate in the right direction. Less-productive producers and producers with declining performance tend to be driven out of the market. Producers that will cease to operate in the next period are on average 7 percent less productive than plants that will continue operating, controlling for industry affiliation and time period.

Box 2: Concentration in the manufacturing sector and its impact on productivity growth

Does competition improve firm performance?
It is widely believed that competition is a good thing. Apart from generating an efficient allocation of resources, competition is believed to put downward pressure on costs, reduce slack, provide incentives for improving production processes, and driving innovation.[7] These beliefs have important policy implications, and have been the rationale of many economic reforms.

It is thus important to understand, first, how competition evolved in the Indonesian manufacturing sector, and second, its links with firm performance.

Competition Trends in the Indonesian Manufacturing Sector
The Herfindahl-Hirschmann Index (HHI) is used to measure the extent of market concentration in a given sector of Indonesian manufacturing.[8]

The evolution of the HHI suggests that market concentration in the Indonesian manufacturing sector has been heterogeneous over the period 1990-2009. While concentration in domestic markets has increased in sectors that have been typically subject to more competition (those in the 25th percentile of the concentration distribution) and in those that are in the middle of the distribution, concentration, as measured by the HHI has decreased slightly in those sectors that have been typically subject to less competition (those in the 75th percentile of the distribution) (Figure 10).

In a relatively open economy like Indonesia, even industries with few firms may face substantial competition if import penetration is high in the sector, or if they compete internationally in export markets.

This is why, to have a better understanding of the extent of competition, the HHI needs to be complemented with measures of exposure to import competition, and to export markets.

[5] Economists have held this view since Adam Smith, who commented, in "The Wealth of Nations", that "monopoly…is a great enemy to good management" (Book 1, chapter 11, p. 165). Of course, this view has been often contested, most notably by Schumpeter, who argued that concentrated markets could promote innovation by providing a stable platform to fund R&D and by making it easier for the firm to capture its benefits.

[6] The HHI is defined as the sum of squares of the share of output of each firm in total domestic output of the industry, at a given year. The indicator would tend to zero in a highly competitive environment, in which there are a large number of firms, each of which holds a very small market share, while it would equal 1 in the case in which one single firm serves the whole market.

[7] See Nickell, S. (1996).

[8] Competition also affects investment in R&D, a key determinant of productivity growth, although the effects are ambiguous. On one hand, competition may increase the costs of failing to innovate, but on the other, R&D efforts are likely to be made if some market power allows firms to appropriate the benefits of those efforts. Ultimately, the effects of competition on productivity growth are likely to be context specific. (see Klinger, B. and D. Lederman (2006)).

The importance of complementing the HHI measuring domestic competition with indicators of openness is evident when looking at concentration trends across different subsectors of manufacturing. For machinery and equipment, for example, concentration at the domestic level almost doubled in this sector, as measured by the HHI (Figure 11). In fact, while real output grew at an average annual rate of 5.6 percent over the period 1990-2009 (which implied real output in 2009 being about three times larger than in 1990), the number of firms operating in the sector declined from about 755 in 1990, to 405 in 2009. However, the sector's exposure to import competition rose substantially, with imports representing about 200 percent of domestic output in the first half of the 1990s, while increasing to more than 500 percent of domestic output in the period 2003-2009 (Figure 12). At the same time, the average export exposure of firms in the sector decreased (Figure 13).

Other sectors in which the evidence on competition trends is mixed, are apparel, wood and wood products, rubber and plastics, electrical apparatus, electrical components, and transport equipment.

In sectors producing food and beverages, as well as furniture, indicators from both domestic and foreign fronts point to increased competition, while the opposite happens for sectors producing textiles, leather and chemicals.

Competition and Firm Performance

Competition matters because it affects incentives to remain efficient, customer oriented, and innovative.[9] The greater the number of players in a sector, the greater the opportunities comparison of performance, and so, the sharper the incentives to be efficient are. Competition also increases the incentives to remain efficient because it raises the sensitivity of profits to the actions of managers and workers.[10]

In Indonesian manufacturing, firms that are subject to more competition tend to exhibit faster productivity growth. Evidence for the from Indonesian manufacturing supports the traditional view that competition is 'good' for firms' performance, as measured by their total factor productivity growth. Controlling for foreign sources of competition (import penetration and export exposure), and for other determinants of productivity growth (firm's time-invariant characteristics, and the share of imported intermediates), firms that operate in sectors with lower market concentration (lower HHI values) exhibit higher records of productivity growth.[11]

More interestingly, the effect of competition on productivity growth is always positive regardless of whether we focus on best performers (firms with relatively faster productivity growth) or worst performers (firms with relatively slower productivity growth).[12] The effect of competition is the largest among worst performers, and the lowest among best performers.

[9] Firm-level productivity growth is modeled as a function of the HHI at a sectoral level (4 digits ISIC), import penetration at a sectoral level (4 digits ISIC), share of exports in the total output of the firm, share of imported inputs in the total input bill of the firm, firm-level fixed effects, and year dummies. 26242 firms are included in the analysis, which on average appear during 5 years on the sample.

[10] To check the effect of competition on productivity growth at different levels of productivity growth, quantile regressions were run at each decile of the distribution. The estimated effects were negative and significant at 10 percent, suggesting that less concentration is associated with faster productivity growth. The exception was the regression at the 9th decile, where the coefficient was insignificantly different from zero, from a statistical point of view. Quantile regressions used the same specification as the mean regression above.

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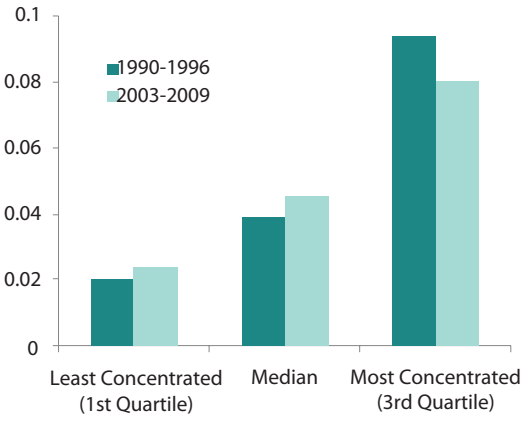
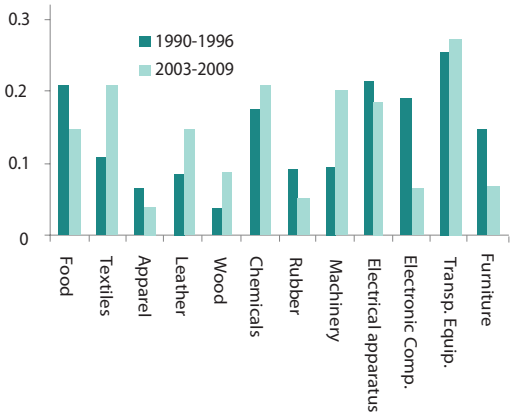
Figure 10: Evolution of concentration by level
(1990-96/2003-09) Herfindahl-Hirschman Index by quartile.



Source: World Bank Staff, based on BPS.
Note: Scale of Index: 1 for pure monopoly, tending to zero for perfect competition).

Figure 11: Herfindahl-Hirschman Index in Indonesian manufacturing by sector
(1990-96 vs. 2003-09)



Source: World Bank staff calculations based on BPS.

Figure 12: Import penetration in Indonesian manufacturing *(1990-96 vs. 2003-09)*

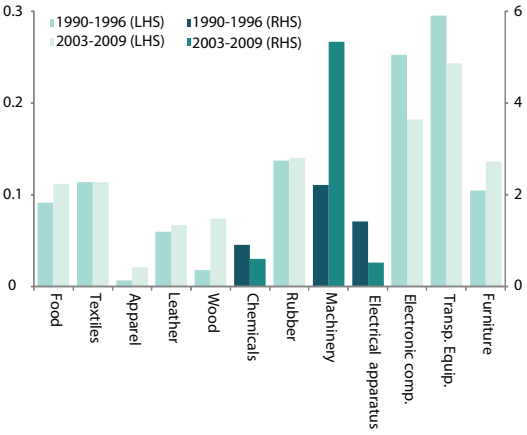
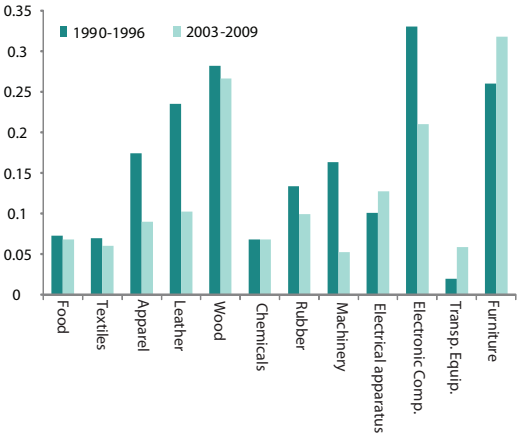


Figure 13: Average share of exports in firms' output
(1990-96 vs 2003-09)



Source: World Bank staff calculations based on BPS.

3. The Role of Allocative Efficiency

Allocative efficiency is important when firms are heterogeneous. Given the substantial heterogeneity of performance across firms, the role of allocative efficiency becomes crucial (see Box 1). If less-efficient firms have large market shares, this means that resources are being used inefficiently and overall productivity suffers. However, if less-efficient firms have small and decreasing market shares, their presence will not affect overall productivity in the economy to a great extent, and a small increase in aggregate productivity will be observed.

Well-functioning factor markets and the ease of entry and exit play a crucial role in determining allocative efficiency. The determinants of allocative efficiency can be grouped into two main sets: (a) quality of factor markets — specifically labor and capital markets (i.e. financial system efficiency and credit allocation), and (b) formal and informal institutions regulating entry to and exit from markets.

Indonesia is among the worst performers in terms of "entry" regulations. Relative to other East Asian countries Indonesia is one of the lowest ranked in terms of the ease of starting a business (see Appendix 1). This is a particularly serious concern because not only do start-ups appear to be among the most dynamic producers in terms of productivity growth (Figure 6), but they also create jobs as we will show further below.

Indonesia is also among the worst performers in terms of "exit" regulations. Barriers to entry may also generate barriers to exit as they increase the cost of subsequent entry and thus create a disincentive for firms to exit.[13] In addition, Indonesia seems to perform rather poorly in terms of the ease of closing a business, further reducing allocative efficiency and incentives to close down an inefficient business (see Appendix 2).

Underscoring the importance of entry and exit, we find that allocative efficiency is positively correlated with the number of entrants and exitors. We calculate the flows of entry and exit at the sectoral level (i.e. 5-digit ISIC rev.3) and find that sectors characterized by more entry and sectors characterized by more exit tend to experience higher levels of allocative efficiency. This suggests that reducing barriers to both entry and exit is potentially an important mechanism to increasing overall productivity by improving allocation of resources.

Reallocation of market shares can operate not only through firms' exit and entry ("between firms' reallocation") but also through product entry and exit ("between product reallocation"). In particular, we find that allocative efficiency is higher in sectors characterized by a higher rate of new product introduction (conditional on the number of produced products, as well as year and industry fixed effects). However, somewhat surprisingly, this is not the case for sectors characterized by a larger number of "dropped products". The latter point may merit further investigation.

Box 3: Importance of imported inputs and machineries

The importance of imported intermediate inputs appears fundamental for most companies interviewed. While the share of imported inputs varies from 5 percent to 95 percent depending on the type of product, and the destination, what is clear is that the possibility of using imported intermediate inputs is a fundamental source of competitiveness.

Export-oriented companies, ranging from those producing shoes to those producing medical appliances rely in large part on imported inputs, even if whenever possible they tend to prefer "purchasing locally". The pervasive importance of accessing imported goods emerges not only for "high tech" or more knowledge intensive companies (i.e. mechanical parts, etc.) but also for "low-tech" companies. Even for a company producing coffee, a basic commodity, mostly for local or regional markets being able to access some "specific" imported inputs is crucial for maintaining its competitiveness.

Even more important appears to be the reliance on imported machineries, especially for smaller local companies. Imported machinery allows accessing knowledge and technology developed abroad, which would be too expensive to develop "in house".

The degree of integration and openness at the sectoral level is positively correlated with allocative efficiency. We find that allocative efficiency is higher in sectors characterized by a greater degree of export orientation, calculated as a share of exported products. An even stronger, and positive, association is found for sectors characterized by higher usage of imported intermediates, defined as the share of imported intermediates in the total intermediates used, and sectors characterized by higher penetration of FDI, measured as the share of sectoral outputs produced by companies with foreign participation. Anecdotal evidence confirms the importance of imported inputs and machinery for Indonesian manufacturers (see Box 3).

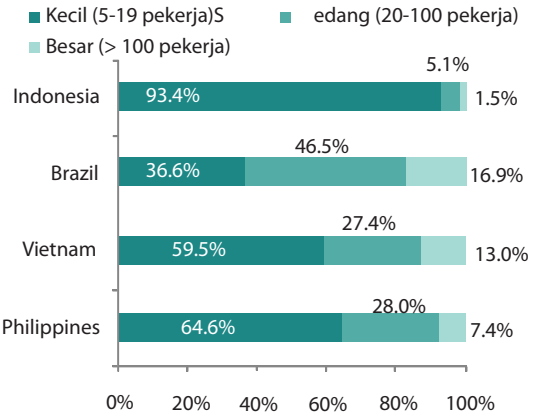
The relationship between exit patterns and the degree of openness to trade at the sectoral level is more complex. The less productive a firm is, the more likely it is to exit. In addition, while firms in sectors that are relatively more export-oriented are more likely to exit, those that operate in sectors with a higher share of multinational companies are less likely to do so. Finally, being in a sector characterized by a substantial use of imported intermediate inputs does not alter the likelihood of exiting.

[13] For entry costs here we are referring not only to licensing requirements, but also to various set-up costs such as finding workers, registering them, getting access to finance, obtaining a construction permit, etc.

4. Plant Size: The Missing Middle

The "missing middle". When comparing plant size distribution between Indonesia and some other emerging countries, differences are apparent. First, the Indonesian manufacturing sector is characterized by a "missing middle". Firms employing 20 to 100 workers constitute only 5.1 percent of all manufacturing firms, compared with almost 46.5 percent in Brazil and 27.4 percent in Vietnam (Figure 14). Second, the percentage of small firms, defined as firms with 5 to 19 employees, is larger in Indonesia, reaching 93 percent versus 37 percent in Brazil. Even compared with Vietnam, the preponderance of small manufacturers in Indonesia is much more significant.

Figure 14: Distribution of manufacturing firms by size



Source: World Bank, Enterprise Survey, 2009.

Recent work by Hsieh and Klenow (2009) and Klapper and Richmond (2001) shows that distortions in firms' size and the allocation of resources across different firms' size groups have major implications in terms of overall productivity growth. There may be various reasons why firms prefer to remain small, one of which could be related to the desire to evade tax and inspections. Lack of access to finance is another factor limiting growth opportunities for small firms. In fact, for smaller companies access to credit is a very important driver of growth and expansion, as their dependence on external finance tends to be higher than that of larger companies (Rajan and Zingales, 1998, 2001).[14] For the causes and consequences of a missing middle in other countries see Box 4.

Box 4: The missing middle – Cases from other countries: causes and implications

The problem of a "missing middle" is not unique to Indonesia and has been pointed out as a crucial challenge for industrial development and job creation in various contexts. This problem of a bimodal industrial distribution was already highlighted by studies more than 20 years ago, such as Biggs and Oppenheim (1986), and was confirmed for various developing countries in Tybout (2000).

Evidence from Africa

For example, in Côte d'Ivoire it was estimated that 74 percent of employment in manufacturing takes place in firms with fewer than 10 employees, 4 percent in firms employing between 10 and 99 employees, while large firms account for 22 percent of employment in manufacturing. Similarly, a more recent paper by Richmond and Klapper (2010) points towards a distorted firm-size allocation in Côte d'Ivoire characterized by a missing middle that is explained by a weak institutional framework and a distortionary tax system.

Evidence from Latin America

A recent IDB (2010) report proposed the idea that the root problem of productivity in the Latin America region is that too many resources are allocated to too many small low-productivity companies and there is a dearth of middle-level and high-productivity firms. The problem is due to the fact that the smallest companies tend to be the least productive. In fact, a Latin American company with more than 100 employees can generate, on average, double the output with the same resources as a company with only 10 to 19 employees.

14 Rajan and Zingales (1998, 2001).

Possible causes and implications

An alternative view of the causes of firm-size distribution is provided by Cabral and Mata (2003) who suggest that the evolution of the distribution of firm size is driven more by access to start-up financing than other market factors such as competition and selection.

An alternative view centering on the institutional environment and tax regime has been proposed by Richmond and Klapper (2010) following work by Gauthier and Gersovitz (1997) on Cameroon. Both studies point to the importance of tax rates and to the fact that mid-size firms end up paying the highest effective tax rates.

The implications of a distorted allocation of resources within the economy were recently explored in an innovative paper by Hsieh and Klenow (2009) who pointed out that a "correct" allocation of resources in the economy (based on a US benchmark) would generate TFP gains of 30 to 50 percent in China, and 40 to 60 percent in India.

Finally, recent work by Bloom et al. suggests that another potential cause for this "imperfect" size-distribution could be driven by availability of managerial capacities, considered a key determinant of productivity and growth.

Source: Biggs and Oppenheim (1986), Hsieh and Klenow (2009), Inter-American Development Bank (2010), Richmond and Klapper (2010), Sleuwaegen and Goedhuysa (2002), Tybout (2000).

The regulatory environment and problems with access to finance could explain the emergence of a missing middle. A poor regulatory environment can affect small firms' preference to stay informal or "stay small" in order to remain "under the radar" and avoid falling into the regulatory net (e.g., tax inspectors). Cultural aspects and the tradition of "family enterprises" associated with limited trust of "outsiders" may explain the fact that firms do not grow beyond a certain threshold. But another important factor behind the missing middle is imperfect financial markets, in which smaller firms are unable to obtain the required finance to expand their operations. In fact, in Indonesia, as noted in Policy Note 4, access to finance is the most important obstacle for operations identified by small firms. This problem has been exacerbated by the relative decline in profitability in Indonesian manufacturing, in comparison with that of natural resource extraction sectors or retail services, which facilitated the flow of credit into the latter sectors, and away from manufacturing (Figure 15 and Figure 16).[15] Box 5 below explains access to finance issues for manufacturers and provides some suggestions for policy-makers.

Box 5: Financing Key to Finding the '*Missing Middle*'

Possible causes and implications

Cross-country evidence confirms our findings in respect of Indonesia (Policy Note 4): access to affordable finance is a binding constraint on firm performance, impacting most acutely smaller firms (Ayyagari, Demirgüç-Kunt and Maksimovic, 2006). A country's level of financial and institutional development is the critical determinant of the extent to which these financing constraints are binding (Beck, Demirgüç-Kunt, Laeven and Maksimovic, 2006).

Transaction costs and information asymmetries can induce credit rationing by lenders (Beck 2007), particularly in developing countries where private sector credit is relatively scarce and information networks are under-developed (Tybout, 2000). Better protection of property rights and more efficient credit information sharing systems are also associated with a contribution by SMEs in the manufacturing sector to employment (Ayyagari, Beck, and Demirgüç-Kunt, 2007).

Given the high degree of fixed costs faced by lenders, the transaction costs, the cost per unit of funding lent, and therefore lending costs, are higher for smaller loan sizes, which predominate at SMEs. SMEs' diversity, relative opaqueness and impaired ability to post collateral also tend to drive up assessment, monitoring and lending costs (Beck, 2007).

The existence of information asymmetries, where the borrowers have more information about the nature of their own actions and investment projects, can give rise to two sources of heightened default risk: adverse selection due to the inherent difficulties in ex-ante credit assessment and moral hazard due to difficulties in ex-post contract enforcement (Beck, 2007). These can be particularly acute for smaller enterprises.

While these elevated costs associated with SME lending could be passed on to borrowers through higher interest charges, this would reduce the pool of viable borrowers seeking lending, thereby worsening the adverse selection problem. Instead, lenders ration credit at an interest rate below the market clearing rate (Stiglitz and Weiss, 1981).

[15] Policy Note 3 of this series discusses the evolution of relative profitability of the manufacturing sector over the last decades.

Financing constraints for SMEs can be addressed through improving the business environment by reducing transaction costs, and reducing the scope for adverse selection and moral hazard (Beck, 2007). These may entail a lower fiscal burden and are less prone to inducing a misallocation of resources than directed or subsidized SME lending.

Strengthening property rights for borrowers, for instance clarifying title of fixed assets, would improve their ability to pledge collateral, access finance, and obtain loans on better terms. Laws and registries permitting the collaterization of movable assets, which often account for a greater share of assets among smaller firms, can offer great benefits to SMEs. In a cross-country survey, Beck et al. (2008) found that smaller firms benefit disproportionally from higher property rights protection through improved access to external finance, particularly from banks.

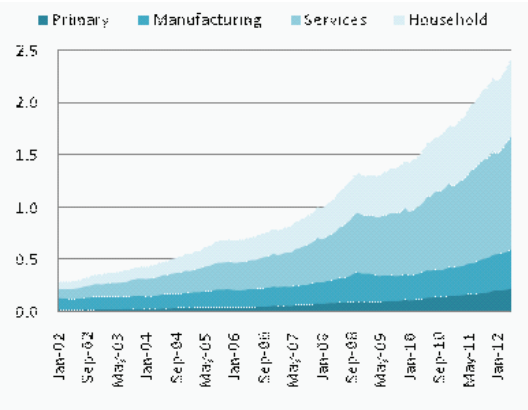
As important as legal provisions ensuring debtors' and creditors' rights is strong enforcement. Amending the Civil Law Procedure to establish a small claims court would facilitate cost-effective, expedited enforcement of contracts by smaller firms by avoiding the need to pursue litigation through the Supreme Court.

Arming lenders with more and better accessible information on borrowers' creditworthiness, by establishing credit registries for example, can help avoid adverse selection while also reducing assessment and monitoring costs. Research by Love and Mylenko (2003) found that the existence of private credit registries is associated with reduced financing constraints and an increase in the share of bank borrowing in overall firm financing.

A public credit bureau (Biro Informasi Kredit, BIK) was established in Indonesia in 2006 to maintain a database of customer credit histories. Easing BIK membership restrictions for non-bank financial institutions may help spur SME lending, Over the longer term, the establishment of private credit registries should be actively encouraged, including joint ventures with major international credit reporting firms.

Figure 15: Growth in lending to the manufacturing sector has lagged behind…

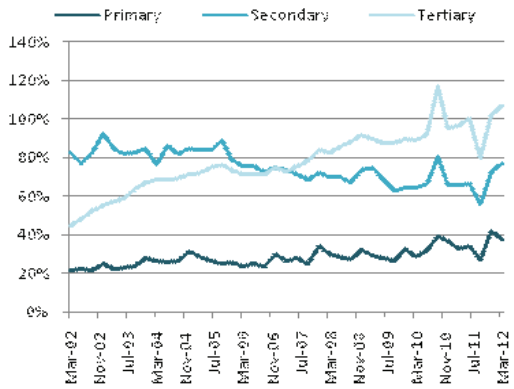
(Total and breakdown by sector of outstanding loans from commercial and rural banks in Rp trillion)



Source: CEIC

Figure 16: … leading to a steady decline in the relative share of manufacturing in overall lending since 2002

(Ratio of nominal lending to nominal GDP, by sector)



Source: CEIC & World Bank staff calculations

The data support the notion that the "missing middle" in the Indonesian manufacturing sector is associated with a worse environment for doing business. Using World Bank Enterprise Survey data, which include data from various emerging markets (Brazil, Indonesia, Vietnam, and the Philippines), it is possible to find a positive correlation between countries characterized by better regulations, as measured by the World Bank's Doing Business indicators, and the share of medium and large companies.

Box 6: Testing the link between the missing middle and the business environment

One of the possible determinants for the existence of a "missing middle" is related to the complexity and "unfriendliness" of the business environment, where large firms are able to negotiate given their size and small firms prefer to remain "under the radar" to elude regulatory enforcement and minimize regulatory costs.

Using data from various World Bank Enterprise Surveys (which are representative of firm populations at the country-sectoral level), it is possible to test this hypothesis in a formal manner. First, we divide the firms into three size groups (large, medium and small) and calculate for each country c and sector j the share of firms of a certain size group. Second, we estimate the following equation, which allows us evaluate(controlling for sector and country fixed effects) to what extent country-sectors characterized by a worse business environment ("in the bottom 20 percent of countries in terms of Doing Business indicators") are also characterized by a smaller share of certain "size" of firms. In particular, we focus on whether a "bad" business environment is associated with a relatively lower share of "large" and "medium" sized firms. [16]

$$\%\ Firms\ of\ certain\ size\ s_{jc} = \beta 1\ Large\ size\ dummy_{js} + \beta_2\ Large\ dummy \times Bottom\ 25\%\ DB_{jc} +$$

$$\beta_3\ Medium\ size\ dummy_{jc} + \beta_4\ Medium\ size\ dummy \times Bottom\ 25\%\ DB_{jc}$$
$$+ Country_c + Sectorj + \varepsilon_{jc}$$

If that is the case, the coefficients b2 and b4 should be negative. The table below reports the results of estimating this equation and shows that in fact, in countries where the doing business environment is "bad", the shares of medium and large size firms are relatively low. In addition, when looking at particular dimensions of the business environment, it is the complexity of starting and closing a business, the quality of enforcement of contracts, the ease with which credit is obtained and workers are hired that matter most for the disproportionate prevalence of small firms.

When looking specifically at Indonesia, financial constraints may also explain part of the missing middle. In Indonesia, financial constraints and imperfect capital markets may also be responsible for the limited graduation out of "small size" groups. As shown in the figure below, small companies seem to disproportionally complain about problems related to access to finance, relatively to large companies.

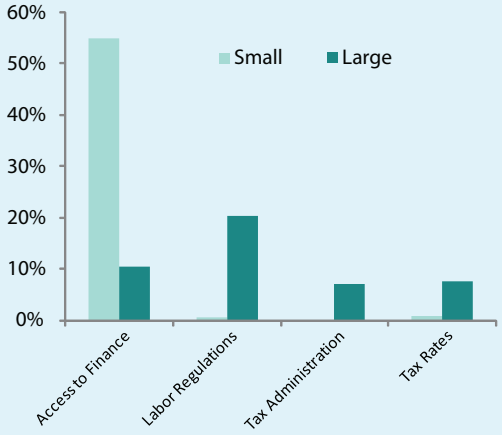
Table 1: A "bad" environment for doing business leads firms to remain small

Variables	(1)
Dummy Large	-1.661
	(8.67)**
Dummy Large * Bottom 25%	-5.218
	(6.57)**
Dummy Medium	0.039
	-0.2
Dummy Medium * Bottom 25%	-5.963
	(7.45)**
Country dummies & Sector dummies	Yes
Observations	11518
R-squared	0.53
Linearized t-statistics in parentheses	

*significant at 5% level; ** significant at 1% level

Source: World Bank Enterprise Survey and Doing Business, 2009.

Figure 17: Financial constraints are especially binding for small companies



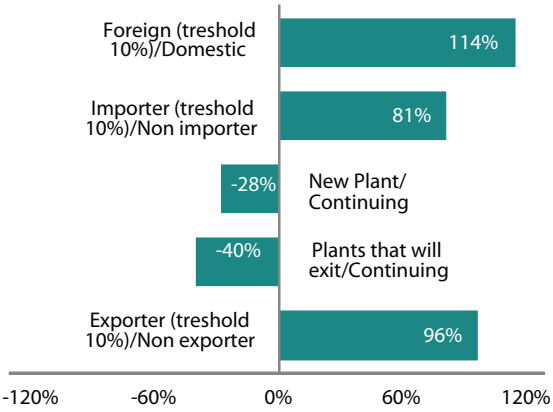
Source: World Bank Enterprise Survey, 2009.

[16] A country is considered to have a "bad" business environment when it ranks in the bottom quartile of the Doing Business ranking, compiled by the World Bank.

5. Jobs and Wages

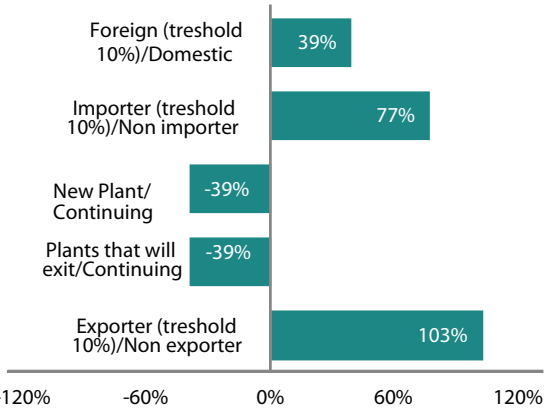
Importers and exporters, as well as foreign-owned plants, tend to be larger and pay higher wages. Producers that are more integrated with the global economy both by exporting a larger share of their output or using imported materials more intensely tend to be on average 80 to 90 percent larger (in terms of employment) than non-integrated plants (Figure 18). Foreign-owned plants on average are twice as large as domestic companies. In addition, workers in more integrated plants receive wage premia ranging from 39 percent in foreign-owned plants to 77 percent in importing plants to more than 100 percent in exporting plants (Figure 19).

Figure 18: Employment premia



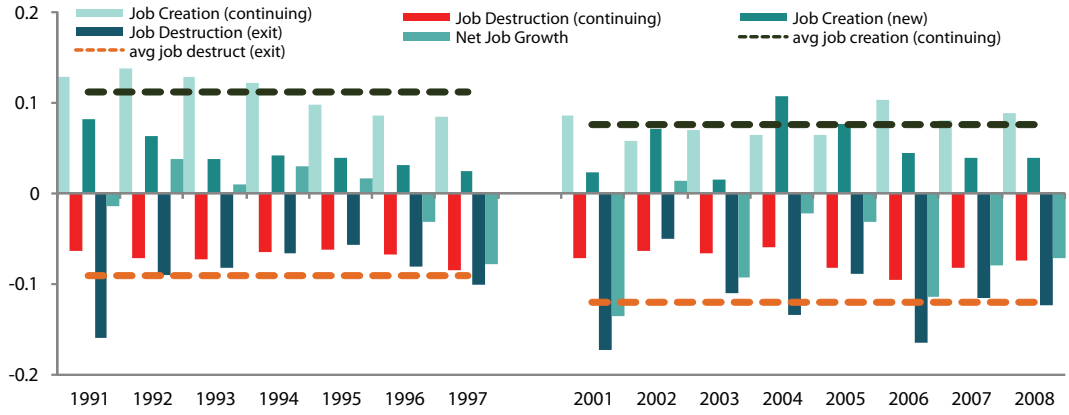
Source: World Bank staff calculations based on BPS data.
Note: These premia are averages for the period 1990-2009

Figure 19: Wage premia



Source: World Bank staff calculations based on BPS data.
Note: These premia are averages for the period 1990-2009.

Figure 20: Job decomposition

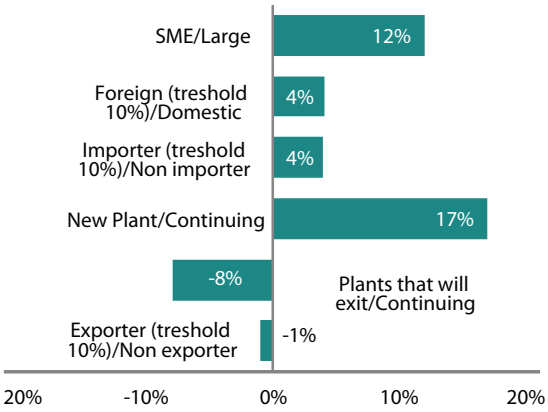


Source: World Bank staff calculations based on BPS data.

The net flow of jobs hides a substantial amount of churning taking place both in continuing companies, as well as through entry and exit. Following Davis and Haltiwanger[17] (1992), we decompose net job flows into four components: (1) job creation by continuing companies (expanding), (2) job destruction by continuing companies (contracting), (3) job creation by new companies, and (4) job destruction by exiting companies (Figure 20). The gross job turnover, which takes into account both job creation and destruction, equals on average 31 percent of total employment, while the net job flow amounts on average to 5 percent.

[17] Davis and Haltiwanger (1992).

Figure 21: Employment growth premia



Source: World Bank staff calculations based on BPS data.
Note: These premia are averages for the period 1990-2009.

While in most years continuing companies contribute to net job creation, the net effect of entry and exit is negative. Most job creation takes place within continuing companies rather than through entry, and most of job destruction takes place through exit rather than within continuing downsizing companies (see Appendix 3). Nevertheless, new entrants tend to outperform other producers in terms of employment growth, as shown in Figure 21. This means that new entrants that survive are a powerful source of employment growth.

There are significant differences in terms of gross jobs flows between SMEs and large companies. In terms of the net effect, large plants contributed more to net job creation than SMEs until the 1997 Asian financial crisis, but after the crisis this pattern reversed and SMEs became the most important net generators of jobs (see Appendix 3). When focusing on gross jobs flows, large plants tend to both create and destroy more jobs than SMEs.[18]

Similarly, there are significant differences in terms of gross job flows between "integrated" companies and domestic ones. Comparing gross job flows between exporters vs domestic, importers vs domestic, and foreign-owned vs domestic firms, the results consistently point towards larger "net job growth" of integrated companies for most years (see Appendix 3). Integrated companies appear to both create fewer jobs than non-integrated ones but also destroy fewer jobs than domestic counterparts.

6. Conclusions

Based on our analysis, we suggest the following policy conclusions:

Governments should focus their support on start-up producers rather than small- and medium-sized enterprises (SMEs). Traditionally, many countries have set up programs to support SMEs based on the argument that these firms create more jobs and play an important role in absorbing young job-seekers. The evidence provided here is consistent with evidence from the US[19] and suggests that a more nuanced view should be adopted. Rather than focusing on small firms the Government of Indonesia should focus its support on young start-up firms, as start-ups exhibit high productivity growth and employment creation. While these young start-ups are overwhelmingly small companies too, there is a stronger rationale for supporting them. However, in general there is little economic rationale for supporting small companies. There are probably good reasons why many small companies never grow, hence extending support to them is unlikely to generate high productivity and employment benefits.[20]

[18] SMEs are defined as plants with employment with 20 to 100 employees because the Statistik Industri does not collect information on smaller producers.

[19] Haltiwanger, Jarmin, and Miranda (2010).

[20] Consistent with the argument about the importance of start-ups but also pointing towards the idea that not all start-ups are set up to grow,

The "missing middle" carries various adverse consequences. There are disadvantages to staying small, especially when economies of scale are important. This is particularly the case for activities that involve fixed costs such as entering export markets, searching and using imported materials, etc.[21] In addition, smaller firms are potentially more exposed to exogenous shocks and, on average, more likely to exit, which may limit the scope for learning-by-doing. Accordingly, this may hamper productivity growth. The existence of a "missing middle" may suggest that Indonesia will endogenously specialize in sectors where access to finance, economies of scale and learning-by-doing matter less, which may be sub-optimal in terms of overall industrial growth and job creation.

Policies aimed at reducing entry and exit barriers in output markets and rigidities in factor markets lead to productivity enhancing market selection, yielding the exit of less-productive firms. Entry costs have been found to: (i) harm allocative efficiency by reducing the amount of entry; (ii) encourage low-productivity incumbents to try to hold on for longer; and (iii) increase productivity dispersion across plants (Hopenhayn, 1992). Rigid labor regulations, for example, by inhibiting expansion or contraction, tend to increase persistence in firms' market shares, price-cost mark-ups, and reduce average productivity in the sector. Policies should also aim at tackling financial market imperfections that may be constraining growth of productive small and medium enterprises. The combination of these types of problems with entry barriers is likely to explain the "missing middle" problem identified above, which prevents smaller firms from "graduating" to "large", denying them the advantages of exploiting economies of scale and challenging large competitors (Tybout, 2000).

Policies increasing exposure to trade and integration with the global economy should be supported given their positive impact on both firm-level productivity and allocative efficiency. By accessing imported materials and machinery, local firms are able to manufacture higher-quality products and indirectly access foreign knowledge. This effect has a direct impact on firm-level productivity. Furthermore, this positive effect is likely to be especially beneficial to more-productive firms, with an additional positive effect on allocative efficiency. Similarly, by generating pressure on firms and increasing the probability of exiting of less-efficient firms, competition with imported products positively influences the overall allocation of resources from less-efficient to more-efficient firms. Finally, a similar effect can be linked to the presence of multi-national corporations through competition effects on firms within the same sector, and through vertical spillovers on firms in upstream sectors (i.e. local suppliers).

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a recent article by The Economist (October 8, 2011) reporting the results of a new study published by The Brookings Institution stresses the idea that not all start-ups are companies that will grow. In fact, the article reports the main conclusion from the study as being that "While most aggregate employment growth may come from small (new) firms growing big, the vast majority of small (new) firms do not grow." (Erik Hurst and Benjiamin Wild Pugsley, 2011).

21 Inter-American Development Bank (2010).

References

Arnold, J., G. Nicoletti and S. Scarpetta (2008), "Regulation, Allocative Efficiency and Productivity in OECD Countries: Industry and Firm-Level Evidence", OECD Economics Department Working Papers, No. 616, OECD Publishing.

Aw, Bee Yan & Chen, Xiaomin & Roberts, Mark J., 2001. "Firm-level evidence on productivity differentials and turnover in Taiwanese manufacturing," Journal of Development Economics, Elsevier, vol. 66(1), pages 51-86, October.

Ayyagari, Meghana; Beck, Thorsten; and Demirgüç -Kunt, Asli (2007). "Small and Medium Enterprises across the Globe: A New Database", Small Business Economics, 2007, Volume 29, Number 4, Pages 415-434

Ayyagari, Meghana; Demirguc-Kunt, Asli; and Maksimovic, Vojislav (2006). "How important are financing constraints? The role of finance in the business environment," Policy Research Working Paper Series 3820, World Bank.

Bartelsman, E.J., J. Haltiwanger and S. Scarpetta (2007), Cross-Country Differences in Productivity: The Role of Allocative Efficiency, mimeo.

Beck, Thorsten (2007). "Financing Constraints of SMEs in Developing Countries: Evidence, Determinants and Solutions" World Bank Development Research Group

Beck, Thorsten; Demirgüç -Kunt, Asli; and Maksimovic, Vojislav (2008). "Financing patterns around the world: Are small firms different?", Journal of Financial Economics 89 (2008) 467–487

Beck, Thorsten; Demirgüç-Kunt, Asli; Laeven, Luc; and Maksimovic, Vojislav (2006). "The Determinants of Financing Obstacles." Journal of International Money and Finance, 25, 932-52

Biggs, T.S., Oppenheim, J., (1986). What drives the size distribution of firms in developing countries? Employment and enterprise policy analysis discussion paper no. 6, (HIID, Cambridge, MA).

Caves, D.W., Christensen, L.R., Diewert, W.E., 1982. The economic theory of index numbers and the measurement of input, output and productivity. Econometrica Vol 5, 1393 - 1414.

Davis, Steven J., and John Haltiwanger. "Gross Job Creation, Gross Job Destruction, and Employment Reallocation," The Quarterly Journal of Economics, 107(3), 819-63, 1992.

Dutz, Mark A., ed. 2007. *Unleashing India's Innovation: Toward Sustainable and Inclusive Growth*. Washington, DC: World Bank.

Haltiwanger, J., R. Jarmin, and J.Miranda, (2010) "Who Creates Jobs? Small vs. Large vs. Young," NBER Working Papers 16300.

Haskel, J. and Martin, R. (2002), "The UK Manufacturing Productivity Spread" Ceriba Working Paper; http://www.ceriba.org.uk

Hsieh, C.T. & P. Klenow (2009). Misallocation and Manufacturing TFP in China and India, The Quarterly Journal of Economics, MIT Press, vol. 124(4), pages 1403-1448, November.

Hurst, E. and Pugsley, B. W. (2011), *Creating Employment: A helping hand for start-ups, The Economist, 2011; "What do small businesses do?"*

Inter-American Development Bank (2010). The Age of Productivity: Transforming Economies from the Bottom Up, Editor Carmen Pages.

Klapper, L. and C. Richmond (2010), "The Political Economy of Firm Size" Paper presented at the World

Bank – Kauffman Foundation Conference on Entrepreneurship and Growth.

Klinger, B. and D. Lederman (2006) "Discovery and Development: An Empirical Exploration of 'New' Products". Policy Research Working Paper 3450, The World Bank.

Love, Inessa and Mylenko, Nataliya (2003). "Credit Reporting and Financing Constraints", World Bank Policy Research Working Paper 3142.

Melitz, M. (2003), "The impact of trade on intra-industry reallocations and aggregate industry productivity", Econometrica, Vol. 71, Issue 6, pp. 1695-1725.

Nickell, S. (1996), "Competition and Corporate Performance", Journal of Political Economy, vol. 104 (4).

Olley, G.S.and A. Pakes (1996), "The Dynamics of Productivity in the Telecommunications Equipment Industry", *Econometrica*, 64(6): 1263-97

Rajan, R. G. and Zingales, L. (1998). "Financial Dependence and Growth", American Economic Review, 88, 559-56.

Rajan, R. G. and Zingales, L. (2001). "Financial Systems, Industrial Structure and Growth", Oxford Review of Economic Policy, 17(4), 467-82.

Sleuwaegen, L. and Goedhuysa, M. (2002). "Growth of firms in developing countries, evidence from Côte d'Ivoire", Journal of Development Economics, 68(1), June 2002, pp. 117-135

Stiglitz, Joseph. and Andrew Weiss (1981). "Credit Rationing in Markets with Imperfect Information", American Economic Review 71, 393-410.

Tybout, J.R. (2000). "Manufacturing firms in developing countries: how well do they do and why", Journal of Economic Literature, 38, pp. 11–44.

Annex 1: Ease of opening a business (DB 2011)

Economy	Ease of Doing Business Rank	Rank	Procedures (number)	Time (days)	Cost (% of income per capita)	Paid-in Min. Capital (% of income per capita)
Singapore	1	4	3	3	0.7	0
Hong Kong SAR, China	2	6	3	6	2	0
Thailand	16	97	7	32	6.9	0
Malaysia	23	111	9	17	17.5	0
Taiwan, China	24	24	6	15	4.1	0
Samoa	55	21	4	9	9.8	0
Tonga	62	30	4	25	7	0
Fiji	72	105	8	46	23.8	0
Vanuatu	75	112	8	47	48.2	0
Solomon Islands	81	110	7	57	68.1	0
Brunei Darussalam	86	134	15	105	13.5	0
China	87	150	14	38	4.5	118.3
Mongolia	89	87	7	13	3.2	46.8
ietnam	90	100	9	44	12.1	0
Papua New Guinea	97	83	6	51	17.7	0
Marshall Islands	102	41	5	17	17.3	0
Kiribati	111	135	7	31	22.8	21.7
Palau	116	112	8	28	6	16.1
Indonesia	126	156	9	47	21.5	53.1
Philippines	134	155	16	36	22.1	6
Micronesia, Fed. Sts.	137	93	7	16	150.5	0
Cambodia	138	170	9	85	128.3	37
Lao PDR	163	88	7	93	8.9	0
Timor-Leste	169	152	10	147	5	247.5

Source: Doing Business Indicators, World Bank.

Annex 2: Ease of closing a business (DB 2011)

Economy	Ease of Doing Business Rank	Rank	Recovery rate (cents on the dollar)	Time (years)	Cost (% of estate)
Singapore	1	2	87.6	0.9	4
Hong Kong SAR, China	2	15	22.2	4	10
Thailand	16	47	36.4	1.7	22
Malaysia	23	57	25.1	3.3	4
Taiwan, China	24	10	0	4.8	76
Samoa	55	146	81.8	1	8
Tonga	62	110	13.2	5.5	18
Fiji	72	123	82.2	1.9	4
Vanuatu	75	51	0	no practice	no practice
Solomon Islands	81	116	0	no practice	no practice
Brunei Darussalam	86	43	53.1	1.2	8
China	87	72	37.9	2	15
Mongolia	89	125	26.8	2	22
Vietnam	90	130	57.6	2	15
Papua New Guinea	97	114	3.2	3	50
Marshall Islands	102	132	41.5	1.5	15
Kiribati	111	183	15.6	5	18
Palau	116	64	25.7	3.3	11
Indonesia	126	149	43.4	2	8
Philippines	134	161	36.8	1.5	22
Micronesia, Fed. Sts.	137	164	33.7	2.2	15
Cambodia	138	150	27.5	3	15
Lao PDR	163	183	29.2	4	9
Timor-Leste	169	183	78.5	1	4

Source: Doing Business Indicators, World Bank.

Annex 3: Job decomposition - SMEs vs non-SMEs

Annex Table 3.1: SMEs vs non-SMEs

	SME					Non SME					Difference SMEs vs Non-SMEs				
	Continuing companies		New companies	Exiting companies	Net Job Growth	Continuing companies		New companies	Exiting companies	Net Job Growth	Continuing companies		New companies	Exiting companies	Net Job Growth
Year	Job Creation	Job Destruction	Job Creation	Job Destruction		Job Creation	Job Destruction	Job Creation	Job Destruction		Job Creation	Job Destruction	Job Creation	Job Destruction	
1990	0.0000	0.0000	0.0120	0.0000	0.0120	0.0000	0.0000	0.0662	0.0000	0.0662	0.0000	0.0000	(0.0542)	0.0000	(0.0542)
1991	0.0132	0.0136	0.0168	0.0546	(0.0382)	0.1131	0.0486	0.0645	0.1054	0.0236	(0.0999)	(0.0350)	(0.0476)	(0.0508)	(0.0618)
1992	0.0140	0.0177	0.0120	0.0273	(0.0190)	0.1220	0.0529	0.0497	0.0599	0.0588	(0.1080)	(0.0352)	(0.0377)	(0.0327)	(0.0778)
1993	0.0155	0.0185	0.0082	0.0233	(0.0181)	0.1118	0.0538	0.0284	0.0580	0.0283	(0.0963)	(0.0353)	(0.0201)	(0.0348)	(0.0464)
1994	0.0122	0.0114	0.0104	0.0219	(0.0107)	0.1079	0.0538	0.0303	0.0425	0.0418	(0.0958)	(0.0424)	(0.0199)	(0.0207)	(0.0526)
1995	0.0113	0.0107	0.0132	0.0171	(0.0032)	0.0860	0.0511	0.0241	0.0391	0.0199	(0.0747)	(0.0404)	(0.0109)	(0.0221)	(0.0230)
1996	0.0104	0.0115	0.0110	0.0285	(0.0185)	0.0750	0.0558	0.0197	0.0506	(0.0117)	(0.0647)	(0.0444)	(0.0086)	(0.0221)	(0.0068)
1997	0.0104	0.0143	0.0063	0.0335	(0.0311)	0.0727	0.0704	0.0171	0.0665	(0.0471)	(0.0623)	(0.0561)	(0.0108)	(0.0330)	0.0160
1998	0.0109	0.0173	0.0049	0.0377	(0.0392)	0.0834	0.0851	0.0166	0.0461	(0.0313)	(0.0725)	(0.0679)	(0.0117)	(0.0084)	(0.0079)
1999	0.0108	0.0108	0.0042	0.0150	(0.0109)	0.0864	0.0721	0.0106	0.0229	0.0020	(0.0756)	(0.0613)	(0.0064)	(0.0079)	(0.0129)
2000	0.0104	0.0097	0.0042	0.0222	(0.0173)	0.0764	0.0489	0.0099	0.0630	(0.0255)	(0.0660)	(0.0391)	(0.0058)	(0.0408)	0.0082
2001	0.0084	0.0116	0.0054	0.0461	(0.0439)	0.0766	0.0596	0.0173	0.1258	(0.0914)	(0.0682)	(0.0480)	(0.0119)	(0.0796)	0.0476
2002	0.0093	0.0086	0.0139	0.0102	0.0044	0.0476	0.0558	0.0570	0.0396	0.0093	(0.0384)	(0.0472)	(0.0431)	(0.0294)	(0.0049)
2003	0.0083	0.0093	0.0041	0.0291	(0.0261)	0.0604	0.0562	0.0105	0.0805	(0.0658)	(0.0521)	(0.0469)	(0.0065)	(0.0514)	0.0397
2004	0.0084	0.0082	0.0231	0.0210	0.0024	0.0549	0.0512	0.0819	0.1124	(0.0269)	(0.0465)	(0.0431)	(0.0588)	(0.0915)	0.0293
2005	0.0102	0.0085	0.0243	0.0194	0.0067	0.0525	0.0739	0.0505	0.0699	(0.0408)	(0.0423)	(0.0654)	(0.0263)	(0.0506)	0.0474
2006	0.0152	0.0125	0.0178	0.0339	(0.0134)	0.0855	0.0817	0.0264	0.1286	(0.0984)	(0.0703)	(0.0692)	(0.0086)	(0.0946)	0.0850
2007	0.0145	0.0181	0.0138	0.0352	(0.0250)	0.0644	0.0632	0.0242	0.0803	(0.0549)	(0.0499)	(0.0451)	(0.0104)	(0.0451)	0.0299
2008	0.0159	0.0126	0.0111	0.0420	(0.0275)	0.0711	0.0620	0.0274	0.0802	(0.0437)	(0.0552)	(0.0494)	(0.0163)	(0.0382)	0.0161

Source: World Bank.

Appendix Table 3.2: Foreign minus domestic, exporters minus non-exporters, importers minus non-importers

Difference - Foreign minus domestic

	Continuing companies		New companies	Exiting companies	Net Job Growth
Year	Job Creation	Job Destruction	Job Creation	Job Destruction	
1990	0.0000	0.0000	(0.0310)	0.0000	(0.0310
1991	(0.0945)	(0.0516)	(0.0426)	(0.1417)	0.0562
1992	(0.0825)	(0.0625)	(0.0277)	(0.0770)	0.0293
1993	(0.0808)	(0.0581)	(0.0228)	(0.0666)	0.0212
1994	(0.0685)	(0.0572)	(0.0178)	(0.0542)	0.0252
1995	(0.0575)	(0.0478)	(0.0193)	(0.0432)	0.0143
1996	(0.0476)	(0.0479)	(0.0184)	(0.0603)	0.0423
1997	(0.0368)	(0.0547)	(0.0051)	(0.0704)	0.0831
1998	(0.0576)	(0.0636)	(0.0085)	(0.0593)	0.0569
1999	(0.0548)	(0.0542)	(0.0114)	(0.0242)	0.0122
2000	(0.0507)	(0.0428)	(0.0058)	(0.0564)	0.0427
2001	(0.0476)	(0.0407)	(0.0099)	(0.1100)	0.0932
2002	(0.0268)	(0.0474)	(0.0507)	(0.0183)	(0.0118
2003	(0.0452)	(0.0412)	(0.0037)	(0.0717)	0.0640
2004	(0.0401)	(0.0434)	(0.0440)	(0.0244)	(0.0163
2005	(0.0346)	(0.0568)	(0.0404)	(0.0531)	0.0348
2006	(0.0531)	(0.0615)	(0.0247)	(0.0794)	0.0631
2007	(0.0392)	(0.0452)	(0.0249)	(0.0595)	0.0406
2008	(0.0355)	(0.0473)	(0.0171)	(0.0838)	0.0785

Difference - Exporters minus non-exporters

	Continuing companies		New companies	Exiting companies	Net Job Growth
Year	Job Creation	Job Destruction	Job Creation	Job Destruction	
1990	0.0000	0.0000	0.0085	0.0000	0.0085
1991	(0.0290)	(0.0239)	(0.0128)	(0.1100)	0.0920
1992	(0.0200)	(0.0241)	(0.0174)	(0.0370)	0.0238
1993	(0.0251)	(0.0200)	(0.0105)	(0.0294)	0.0139
1994	(0.0268)	(0.0207)	(0.0027)	(0.0223)	0.0136
1995	(0.0289)	(0.0208)	(0.0158)	(0.0131)	(0.0108)
1996	(0.0210)	(0.0215)	(0.0165)	(0.0270)	0.0110
1997	(0.0243)	(0.0322)	(0.0090)	(0.0386)	0.0375
1998	(0.0195)	(0.0454)	(0.0045)	(0.0390)	0.0604
1999	(0.0170)	(0.0375)	(0.0114)	(0.0158)	0.0249
2000	(0.0183)	(0.0150)	(0.0038)	(0.0361)	0.0291
2001	(0.0315)	(0.0115)	(0.0124)	(0.0463)	0.0139
2002	(0.0178)	(0.0079)	(0.0158)	(0.0126)	(0.0130)
2003	(0.0188)	(0.0129)	(0.0043)	(0.0408)	0.0306
2004	(0.0084)	(0.0191)	(0.0331)	(0.0156)	(0.0068)
2005	(0.0199)	(0.0086)	(0.0395)	(0.0323)	(0.0185)
2006	(0.0269)	(0.0248)	(0.0285)	(0.0561)	0.0255
2007	(0.0293)	(0.0248)	(0.0292)	(0.0500)	0.0163
2008	(0.0451)	(0.0251)	(0.0272)	(0.0570)	0.0097

Difference -Importers minus non-importers

	Continuing companies		New companies	Exiting companies	Net Job Growth
Year	Job Creation	Job Destruction	Job Creation	Job Destruction	
1990	0.0000	0.0000	0.0068	0.0000	0.0068
1991	(0.0309)	(0.0376)	(0.0090)	(0.0645)	0.0623
1992	(0.0214)	(0.0394)	(0.0112)	(0.0379)	0.0448
1993	(0.0242)	(0.0389)	(0.0034)	(0.0349)	0.0461
1994	(0.0215)	(0.0308)	(0.0072)	(0.0227)	0.0247
1995	(0.0113)	(0.0282)	(0.0104)	(0.0169)	0.0234
1996	(0.0122)	(0.0257)	(0.0127)	(0.0284)	0.0291
1997	(0.0040)	(0.0247)	0.0006	(0.0256)	0.0470
1998	(0.0271)	(0.0225)	0.0003	(0.0264)	0.0219
1999	(0.0065)	(0.0241)	(0.0004)	(0.0089)	0.0262
2000	(0.0075)	(0.0230)	(0.0010)	(0.0195)	0.0340
2001	(0.0231)	(0.0173)	(0.0019)	(0.0507)	0.0430
2002	(0.0137)	(0.0186)	(0.0114)	0.0002	(0.0067)
2003	(0.0190)	(0.0173)	0.0004	(0.0404)	0.0391
2004	(0.0118)	(0.0210)	0.0248	0.0291	0.0049
2005	(0.0059)	(0.0357)	(0.0102)	(0.0210)	0.0406
2006	(0.0114)	(0.0352)	0.0013	0.0055	0.0196
2007	(0.0197)	(0.0198)	(0.0080)	(0.0169)	0.0090
2008	(0.0128)	(0.0147)	(0.0065)	(0.0383)	0.0336

Source: World Bank staff.