As the Market Churns

Estimates of Firm Exit and Job Loss Using the World Bank's Enterprise Surveys

Gemechu Aga
David Francis

WORLD BANK GROUP

Development Economics

Global Indicators Group

March 2015

Abstract

This paper uses a unique data set of panel firms from the World Bank's Enterprise Surveys in 47 economies, to provide estimates of the patterns of firm exit, and analyzes various firm characteristics and conditions under which firms leave the market. Firms' labor productivity and age are robustly associated with a lower likelihood of exit, consistent with conceptions of creative destruction and findings elsewhere in the literature. These findings are robust across several specifications. However, the effects are mitigated by other factors, such as use of bank financing and the

presence of limited liability. Although firm size does appear to matter, its effect is lessened after accounting for labor productivity. The paper also provides basic estimates of job loss attributable to firm exit, estimating that on average 3 to 4 percent of private sector employment is lost per annum due to firm exit. Because of the challenges of data collection, the analysis relies on a necessarily conservative definition of exit and provides a framework for future work on utilizing such periodic survey panels to estimate the relative patterns of firm attrition and the associated job loss.

This paper is a product of the Global Indicators Group, Development Economics. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The authors may be contacted at dfrancis@worldbank.org.

The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

As the Market Churns: Estimates of Firm Exit and Job Loss Using the World Bank's Enterprise Surveys

Gemechu Aga
Development Economics, Enterprise Analysis
World Bank
Washington, DC

David Francis
Development Economics, Enterprise Analysis
World Bank
Washington, DC

Key words: Business environment, firm dynamics and productivity growth, business entry, trade and firm exit, business climate and jobs

JEL Codes: J21, J24, J65, D22, K20, K35

I. Introduction

The process of creative destruction – whereby an economy reinvents itself through a continual displacement of less productive firms and old production processes with newer and more efficient ones – plays an integral role in an economy’s sustained growth and structural transformations. Through this churning, the economy’s scarce resources are reallocated to more promising firms and sectors, theoretically raising overall productivity and speeding up the process of structural transformation. There has been a growing interest in measuring the degree of creative destruction in an economy, using firm entry and exit as a proxy measure, so-called “firm turnover”. In addition to firm entry and exit, these studies also look at the reallocation of jobs, meant to capture the magnitude and speed with which labor is being shifted to more productive firms and sectors.

These studies, however, typically have relied heavily upon establishment or economic census data, often only in the manufacturing sector, and analyses have only been available for developed economies, with a handful of notable exceptions.¹ Moreover, the studies that do take advantage of high-quality census or registration data in developing – often upper-middle-income – economies often re-visit the handful of countries where these sources are available.² By analyzing a wide and repeated cross-section of firm (or factory)-level data, these efforts provide a panoramic view of both entry and exit flows, and they have generally shown these rates to be substantial, with significant productivity and re-allocation effects (see for instance, Disney et al (2003); Foster et al (2008); Foster et al (2001)). Nonetheless, the sparse number of comprehensive and regularly collected census data has limited broad comparability across several economies. Additionally, what these census data offer in breadth of coverage within an economy, they often lack in depth in terms of descriptions of firm characteristics and how those aspects relate to firm entry and exit.

Given the limited number of widely comparable, census-based estimates of entry and exit rates, an alternative approach, followed by some studies, has been to concentrate on just firm exit. On the assumption that firm productivity is a driving force of exit – in the sense that less productive firms exit at a more frequent rate – one can partially capture the intensity of creative destruction by looking

¹ Examples include Liu (1993), Liu and Tybout (1996), Shiferaw (2009), Sandefur (2010), Klapper and Richmond (2011), Hallward-Driemeier and Rijkers (2013), and Kerr, Wittenberg, and Arrow (2014).

² For instance, several studies leverage excellent census data from select countries where this information is available. Several of these studies are in turn limited to the same list of countries in economies such as Chile, Colombia, Ethiopia, Indonesia, and South Africa, to name a few.

at which firms leave the market and under what conditions. Although partial, these studies can provide comprehensive insight. Such studies often employ in-depth, firm-level panels, with detailed information on firm characteristics and cover sectors of the economy beyond manufacturing (for instance, Frazer (2005) and Söderbom et al. (2006) utilize survey data in Ghana, Tanzania, and Kenya). While the exit of less productive firms from the market can proxy for creative destruction, the persistence of less productive firms may likewise indicate market distortions, possibly dampening overall economic output.

Within this body of literature, the beginnings of a consensus have started to emerge. Older firms tend to survive longer in the market, as do more productive firms, all else equal. Similarly, larger firms tend to have a lower likelihood of exit (see for instance, Aldrich and Auster (1986); Fackler et al (2013; Shiferaw (2009)). Myriad market effects and shocks, including crises and trade liberalization, have also been shown to have significant effects on firm survival (for instance Pavcnik (2002) or Hallward-Driemeier and Rijkers (2013)). Yet these efforts rely on limited-scope studies, and little has been said about how widely these results hold: broad-reaching, comparable analysis of exit rates in several economies – and their regulatory and policy environments – is currently missing in the literature (see Cirmizi et al 2010 for a discussion).

The current paper follows such an approach by utilizing broad, comparable, panel data, in an attempt to describe patterns and determinants of firm exit. Its contribution is three-fold. First, we provide estimates of the magnitude of firm exit for a large set of developing economies using unique, comparable data. We use a unique variable in the World Bank's Enterprise Survey (ES) where firms interviewed in previous rounds are each contacted several years later to ascertain whether the firm is still operating (more on this in section II). This estimate facilitates cross-country comparison of the size of firm exit and thus may provide a partial glimpse into the extent of creative destruction for these developing economies. Secondly, we study the key predictors of firm exit to see if exiting firms are indeed less productive as well as analyzing the effects of several firm- and country-level attributes that predict exit. Importantly, by using a wide range of economies, we also provide analysis for comparative, macro-level factors. Finally, we provide an estimate of the magnitude of job loss due to the exit of these firms. For each of these areas, we believe, such analysis has not been previously presented over such a wide set of developing economies.

To preview our results, utilizing two necessarily conservative definitions of firm exit, we find that on average 3.7% to 5.4% of firms exit the market per year. We further find that our measure of labor productivity enters with the expected sign at a highly significant level, indicating that the process of creative destruction is likely at work. We find consistent evidence that firm age is inversely and significantly related to the likelihood of exit, and while firm size matters, its effect largely disappears after controlling for firm age and productivity. In terms of job loss, we estimate that exiting firms account for about 2.9% to 4.2% of the private sector employment (per annum) in the economy relative to the base year. The estimates of exit for these set of economies are broadly similar to figures reported for comparable countries using census-based estimates, though such census-based numbers are sparse.

The rest of the paper is organized as follows. Section II provides a brief conceptual framework. Section III discusses our data sources and the definitions of measures of firm exit used in the paper. Section IV presents the results and analysis; section V concludes with discussion and further recommendations.

II. Conceptual Framework

This section provides a summary of some of the key determinants of firm exit to guide the empirical estimation in section IV of the paper. Determinants of firm exit have been extensively analyzed both theoretically³ and empirically. A common thread in the literature is that firms operate under constant risk of exit, deciding (or are forced) to exit the market if the discounted value of their future stream of profits is lower than the return on alternative investment. We follow a well-known model developed by Ericson and Pakes (1995) and furthered in Olley and Pakes (1996) and explicitly link a firm's decision to continue operations to its productivity, given by the following binary choice equation:

$$ext = \{1 \text{ if } \gamma_t < \gamma(x); 0 \text{ otherwise} \quad (1)$$

Where *ext* is an indicator of whether the firm exits the market or not, γ_t is the current level of productivity, $\gamma(x)$ is the minimum level of productivity required to continue operating, and x represents various firm-, market- and country-level factors affecting the likelihood of exit. The model

³ Several influential theoretical works include Jovanovic (1982), Hopenhayn (1992), Ericson and Pakes (1995), Olley and Pakes (1996).

underscores that productivity plays a central role in a firm's ability to stay in business and that there is an optimal threshold of productivity, where firms with a level of productivity below the threshold cease their operations. The premise of inferring the intensity of creative destruction based on the rates of firm exit rests on the assumption that it is the less productive firms, by virtue of falling below a certain threshold, that exit the market. If this process of leaving the market is not fundamentally related to firm productivity, exit rates may not necessarily indicate whether the process of creative destruction is at work or not. If the process of creative destruction is indeed at work, all else the same, firms with high productivity are less likely to exit (Hopenhayn (1992) and Fariñas and Ruano (2005)) and depending on the effect of firms' exit on inputs, surviving firms may even become more productive (Pavcnik (2002)).

Various theoretical and empirical models have also suggested other important firm-level characteristics may be at play in predicting exit. The age of a firm, in particular, is a key attribute. Studies modeling firm dynamics show that the age of the firm can be important for its survival (Jovanovic (1982); Pakes and Ericson (1998)). In particular, younger firms are predicted to have higher risks of exit. Mobilizing suitable factors of production and establishing relations with customers and suppliers may generally take time, putting new entrants at disadvantage compared to old incumbents. Further, learning based models of firm dynamics (e.g., Jovanovic 1982) argue that entrepreneurs need time to learn their true productivity and decide whether to exit or stay in the business. Those who discover that their productivity is lower than what is required to survive presumably exit the market, thereby raising the exit rate at the early age of firms. Older firms, on the other hand, face less such risk perhaps because they have already leveraged their productivity advantages and know that they are efficient enough to compete, or because they have accumulated enough competitive skill to be efficient and survive. Conversely, some have argued that younger firms could in fact have a better chance of survival than their old counterparts (Llopis et al (2004)). New entrants often come to the market with new ideas and strategy to compete with incumbents, but these ideas and vigor may erode over time as the firm grows older.

The size of a firm is another critical micro-level variable related to the likelihood of exit (Jovanovic (1982); Pakes and Ericson (1998)). In particular, the hazard of exit is predicted to decline with firm size, known in the literature as the "liability of smallness" (Aldrich and Auster (1986)). This can arise from the fact that larger firms can reap the benefits of economies of scale and scope, attract

better qualified employees, have better access to credit, and have the ability to diversify operations, all enhancing performance and reducing the likelihood of exit. Further, the size of the firm generally proxies for various unobservable firm attributes, such as the ability of the manager.

Models of international trade based on heterogeneous firms have shown that exposure to international trade also affects the likelihood of exit (Melitz, 2003). The direction of the effect is, however, not clear and depends to a great extent on various circumstances. On the one hand, opening to international trade, through for instance trade liberalization measures, can expose firms to competition from potentially more productive foreign firms, forcing domestic firms to lose market share, revenue and profit, ultimately pushing them to exit the market (Melitz, 2003). Alternatively, better access to international markets may enable firms to increase the scale of operation and exploit economies of scale, improve their access to imported intermediate inputs and productivity enhancing technologies. Through these productivity enhancing benefits, exposure to trade can, therefore, reduce the likelihood of exit. Further, models linking exporting status to firm survival show that these firms are less likely to exit compared to non-exporting firms (Bernard et al. 2002). This is partly because exporting enables firms to diversify their sales and reduce the risk of exit arising from negative shocks to the domestic economy (Wagner and Gelübcke (2012)). It could also be because only efficient firms can penetrate and compete in international markets, in which case, controlling for productivity, the exporting status of a firm should not have a significant effect on its survival.

The nature of ownership is another potential factor associated with the likelihood of exit. Various studies have explored the link between foreign-ownership and the risk of exit (Bernard and Sjöholm (2003); Wagner and Gelübcke (2012); Baldwin and Yan (2011)). The direction of the effect is, however, not clear a priori. Foreign-owned firms may have a lower risk of exit compared to fully domestically owned ones, by virtue of having better connections and consequently better access to foreign markets, technologies and expertise. This effect, though, may be in part driven by the fact that these firms tend to be larger and well-established (Bernard and Sjöholm (2003)). It might also be because foreign-owned firms often receive special treatments from policy makers as an incentive to attract foreign investment, conferring upon these firms survival advantage over domestically owned firms (Shiferaw 2009). On the contrary, foreign firms may lack the local knowledge to coordinate business and navigate the local markets. Further, foreign-owned firms tend to be footloose compared

to domestically owned ones and can locate their production to other countries if the local conditions are found to be less promising; hence they are more likely to exit than domestically owned firms.⁴

Gender of the owner is another important ownership dimension linked to firm exit. A growing body of evidence has argued that women tend to be more risk averse, and therefore, more likely to invest in and undertake activities with lower risk than men do (Croson and Gneezy (2009); Charness and Gneezy (2012); Faccio et al (2014)). The gender of a firm's manager can therefore be associated with the firm's likelihood of survival, though the direction is not entirely clear. Female managers can engage in less risky endeavors, often to the benefit of a firm's survival (Faccio et al (2014)), for instance, by maintaining lower levels of leverage. But differences in risk-taking behaviors can converge between the subsets of men and women that are entrepreneurs (Croson and Gneezy (2009)), when compared to the population at large.

At the core of the process of creative destruction is a well-functioning financial system (King and Levine (1993); Levine (2005)). By continually re-allocating capital to the most efficient and innovative firms and sectors of the economy, a well-functioning financial system can serve as the catalyst for the process of creative destruction. Access to external finance enables firms to invest in productivity-enhancing activities, such as new technologies, expansion and opportunities with higher returns. More importantly, it eases entry by more productive and innovative firms that could potentially displace the less productive and stagnant ones. Further, access to external finance allows firms to weather away the impacts of temporary shocks that would otherwise force them to exit. Therefore, we expect firms with better access to external finance to have a lower risk of exit than those with limited access.

Harhoff et al (1998) additionally study the impact of a firm's legal structure and argue that limited liability firms have higher growth and exit rates compared to firms with other legal structure. Limited liability incentivizes investing in higher return and higher risk activities since liability in the event of failure is limited to just the assets of the firm compared to other legal forms. There could also be a selection effect, in that firms with inherently higher return and risk may opt to organize as a

⁴ Bernard and Sjöholm (2003), for instance, find that after controlling for size and productivity, the effect of foreign ownership is reversed, with multinationals more likely to exit the market, likely due to such a "flight" effect.

limited liability company. Therefore, all else the same, limited liability firms are more likely to exit than firms with other legal structure.

In addition to micro factors, a growing literature also examines the link between meso-level factors and firm exit. The industrial affiliation of a firm is among these factors (Agarwal and Gort (2002) and Box (2008)). Industries differ in the level of the maturity of products produced, whereby sectors with more mature products exhibit lower levels of churning compared to industries with relatively new products. Further, the intensity of innovation (and the risk of rendering a product obsolete) could also vary by the sector of the economic activity, where firms operating in industry with a higher intensity of innovation face a higher risk of exit than those operating in a less innovative industries (Agarwal and Gort (2002)). The literature on agglomeration and economic clustering shows that locating in business cluster areas enhances a firm's access to knowledge, a better pool of qualified workforce, and demand for product and services, thus improving the firm's performance and survival. However, locating in such an environment also exposes the firm to often intense competition, raising the risk of its exit (Keil and Pe'era (2012)). This risk is particularly imminent in an environment where the market is dominated by few market players and where competitors are of higher productivity than the firm.

The literature on firm survival has recently taken strides in incorporating macro-level indicators of the policy environment, particularly regarding barriers to firm entry and exit. Lower barriers to entry have been shown to be related to higher rates of new-firm formation (see for example Klapper et al (2006)), but little has been said about firm exit as it relates to barriers to entry. The research that has addressed the issue has found that greater entry rates – but not necessarily policies – are generally found where exit rates are also high (Dunne et al. (1989) and Cable and Schwalbach (1991)). Where policy-related barriers to entry are examined, those firms that do enter under higher, protected barriers are generally found to survive longer (Box (2008)).

On the other end of the lifespan of firms, some studies have analyzed the effects of resolving insolvency on firm exit (Thorburn (2000); Couwenberg (2001); Dewaelheyns and Cynthia Van Hulle (2008)). A greater ease of exiting the market through bankruptcy can induce new entrants into the market by minimizing their risk, introducing competitors to incumbent firms (Ahlstrom and Bruton, 2004) or expedite the exit of insolvent firms by allowing them to maximize the return on their assets. Conversely, efficient bankruptcy laws can allow firms to regain their solvency (Couwenberg (2001)),

but this likely depends on a firm's legal status (Dewaelheyns and Cynthia Van Hulle (2008)). One of the advantages of the broad approach we utilize here is to leverage other global, comparable data, such as the World Bank's Doing Business database, while also considering several macro-level controls.

III. Data and Methodology

The Data and Measuring Exit

We use data taken from the World Bank's Enterprise Surveys (ES) project (www.enterprisesurveys.org). Since 2006, the World Bank has consolidated – under one centralized methodology – the collection of these firm-level data. The surveys are conducted on a semi-regular basis, usually with a cycle of 4 to 5 years between rounds, and they cover a wide range of topics affecting the business environment and firm performance. One key facet of this harmonized methodology is that the ES maintain a consistent and clearly defined universe of inference, defined as formal,⁵ private-sector establishments with at least 5 employees, operating in manufacturing or select service sectors.⁶ The ES data, moreover, take advantage of this single and comparable universe to be representative of the national private-sector economy; accordingly, all estimates here are survey-weighted unless otherwise stated.

A key priority in the collection of the ES data is the maintenance of panel data, allowing researchers to investigate changes in the business environment over time. While the construction of these panels is the key focus of data collection, meticulous effort is simultaneously taken to gather information on the operating (or eligibility) status of all firms previously interviewed, including those that have ceased operations. Firms' so-called eligibility status is determined and assigned in an initial screening phase, which occurs prior to the full ES interview, independent of the current-round survey design or a firm's willingness to participate. This ensures that information on the representative sample of firms from the previous round is captured, allowing for an indicator of the firm survival/exit dynamics over the elapsed time between the two survey rounds.

In practice, though, determining firms' eligibility status can be challenging. Firms operate within the tectonics of often-shifting business environments, and their exact status can be difficult to

⁵ Though several disparate measures of formality have been used in the literature, the ES methodology define "formal" enterprises as those registered with the relevant authority, often the tax authority or relevant business registry.

⁶ Sectors of activity are defined by their ISIC Rev. 3.1 classification and include all manufacturing under Group D as well as service sectors comprised of Group F (construction), Group G (wholesale and retail trade), Group H (hotels and restaurants), Group I (transportation), as well as IT firms (ISIC code 72).

ascertain. The ES methodology includes over 20 distinctly defined codes applied as the result of the screening process, including such wide-ranging possibilities as another firm purchased the existing establishment, while retaining the original name or that a screening interviewer could only encounter a fax line. This broad range of codes is a reflection of the challenge of confirming firms' operating status in practice and is underlined by a central conundrum to using surveys to determine firms' exit from the market: how can "dead" firms be surveyed to confirm that they have in fact left the market? What is more, with the passing of time, firm contact information may change: firms may simply move, change their phone number or location, or be subject to a buy-out or merger. Each of these can affect the ability of data collectors to assess a firm's operating status at a later date. Complicating this fact is the risk that original contact information may not be accurately recorded through simple implementation error.

We utilize two definitions of firm exit to help mitigate the effect of potential bias resulting from these challenges. Both measures are "positive-confirmation" variables and begin from the assumption that firms previously operating continue to exist unless it is directly confirmed that they have exited the market.⁷ The first definition, *strict_exit*, is a variable that considers firms as exiting the market if (1) it is confirmed in the screening process that the firm is now out of operation; (2) it is confirmed that the firm or its available contact information now corresponds to an ineligible activity or status, such as a fully state-owned firm, an out-of-universe activity, has moved abroad, or is no longer registered; or (3) the listed contact information leads to a dead line or non-operating phone line, with all other efforts to obtain contact information exhausted. A second measure, *weak_exit*, further includes (4) cases where contact information is incorrect and no new records are available. In this way, the *strict* definition provides a semi-conservative measure of firm exit, while *weak* additionally accounts unobtainable contact information.

Measurement Issues

Our measures of firm exit are necessarily conservative for several reasons. First, short of a full-scale, annual establishment census, the ES methodology necessarily relies upon a sample of active

⁷ These definitions are almost necessarily conservative compared to a "negative-confirmation" definition, where firms are assumed as exiting the market unless they are actively confirmed in a survey or census. As the ES data relies upon a randomized sample of firms, and not a full enumeration or census, we choose to take this more conservative approach.

establishments. These surveys invariably have non-response and so the inability to confirm a firm's operating status due to a refusal may just as likely be an indication of implementation as it is of firm exit. For this reason, we choose not to consider refusals to the screening stage as indication of a firm exiting the market. While this method is necessarily conservative, it does avoid the inclusion of firms that are not in fact operating while maintaining a listing in the business registry or a physical, but dormant, establishment. Incidentally, this is a problem not completely avoided by using census data, as other researchers have defined firm exit to include those firms whose employment levels drop below a certain threshold (such as 10 employees); for simplicity's sake we forego making similar decisions here, though this would be possible with the available data. In this way, we intend to most accurately indicate those firms that have in fact ceased operations or exited the market, though we concede that this approach is conservative and may underestimate actual magnitudes of firm exit.

A second issue arises from the semi-frequent nature of the Enterprise Surveys. As noted above, it is generally regarded that firms entering the market tend to be smaller and face a higher likelihood of exiting the market as they have not yet scaled up production, invested in sunk-cost capital (for instance, see Rosenbaum and Lamort (1992) and Austin and Rosenbaum (1990)), or have had the chance to accumulate knowledge or managerial expertise and know-how (see Bloom and Van Reenen (2010); indeed our own empirical findings in the following section confirm the effect of firm incumbency on the likelihood of survival. A consequence of this relationship, though, is that with elapsed time periods between survey rounds, a certain number of new-entrant firms are likely to begin operations and close their doors before the follow-up round of the ES. We have no way to measure these exiting firms and so regard our measure of firm exit as a lower bound. Further work incorporating external data sources on entrants⁸ and exiting firms, with consideration for the compatibility of the specified universe of inference.

While we note that the previous two points indicate that our measures of firm exit are necessarily conservative, the role of the source sample frame should also be noted. The quality of various censuses and registries certainly varies substantially, and thus studies relying on these sources – and those that define market exit as disappearance from those records – also depend on the completeness and quality of the original data. As we note, the ES do not benefit from such breadth, justifying an approach such as the one we have taken. The ES implementation takes pains to record

⁸ One such data source is the World Bank's Entrepreneurship Survey and database (<http://econ.worldbank.org/research/entrepreneurship>).

and review respondent contact information at the time of survey, meaning that the second-round verification of a firm's operating status benefits from contact information that has already been vetted. This process adds an additional layer of quality control in the face of sample frame sources of differing quality. We note that this process may further result in discrepancies with studies based on administrative sources, though we remain agnostic to the size and direction of this effect, further indicating a need for utilizing multiple definitions of firm exit.

IV. Results and Analysis

Estimates of Exit Rates

Table 1 displays the distribution of firms by the broad classification of their current eligibility status. Over 52 percent of all firms previously interviewed were confirmed as eligible establishments still in operation; by contrast, just over 6 percent of firms were directly confirmed as having gone out of operation or being in an ineligible activity. Over 7 percent of firms had a dead line, with no new records available. Just over 8 percent of firms had incorrect information, for one reason or another, with no new records available. Table 1 also shows the counts of firm exit by both *strict_exit* and *weak_exit*; 3,580 (out of 22,824) firms are considered as exiting under the strict definition, compared to 5,094 under the weak definition.

Table 1: Distribution of firms by Eligibility Criteria

Eligibility	n	Percent	Cumulative
(0a.) Confirmed: Eligible Establishment	11,923	52.24	52.24
(0b.) Confirmed: Active Line (incl. refusals)	5,395	23.64	75.88
(1.) Confirmed: Out of Operation	1,455	6.37	82.25
(2.) Confirmed: Ineligible Activity	590	2.58	84.84
(3.) Dead Line	1,535	6.73	91.56
(4.) Incorrect/Unobtainable Information	1,926	8.44	100.00

Total	22,824		100	
<i>Un-weighted</i>				
Status	strict_exit		weak_exit	
	n	Percent	N	Percent
Surviving	19,244	84.65	17,730	78.01
Exiting	3,580	15.35	5,094	21.99
<i>Un-weighted</i>				

In all, data are available for 22,824 firms interviewed in 47 economies⁹ over an initial wave of first-round surveys; on average, there is period of just over 4 years between survey rounds. Annex Table 1 includes the descriptive statistics of the survey rounds, including all economies that have included multiple rounds under the globalized ES methodology since 2006. The last column includes the weighted estimate of the number of firms represented, which are collectively almost 684,000. Table 2 presents estimates of exit rate, based on our two measures, for each of the economies in the sample. The table also provides estimates of the share of employment in the base year accounted for by the exiting firms, providing a rough estimate of the job loss associated with firm exit. Based on our conservative measure of exit, *strict_exit*, on average, approximately 16% of the firms exited the market between the two rounds of survey. The values range from as low as 2% in Macedonia to a high of 68% in Ghana.¹⁰ The annualized exit rates, i.e. divided by the number of years between each survey round, range from less than 0.4% for Macedonia to 11% in Ghana, with an average of about 4% per annum for all the countries in our sample.

Table 2: Estimates of firm Exit and Job loss Rate by Country

Country	strict_exit		Job loss (strict_exit)		weak_exit		Job loss (weak_exit)	
	Cumulative	Annualized	Cumulative	Annualized	Cumulative	Annualized	Cumulative	Annualized
Argentina	3%	1%	5%	1%	6%	2%	6%	2%
Armenia	10%	2%	6%	1%	12%	3%	7%	2%
Azerbaijan	18%	5%	13%	3%	30%	8%	19%	5%

⁹ The initial round for Venezuela (2006) utilized a limited questionnaire and omits certain key covariates. As a result, we remove Venezuela for all analysis (n=500) so as not to bias our results by the inclusion or exclusion of an entire survey round as new variables are introduced. Annex Table 1 provides the list of countries and survey years included in the analysis.

¹⁰ Noting that a period of six years passed between survey rounds in Ghana.

Belarus	9%	2%	3%	1%	9%	2%	3%	1%
Bolivia	7%	2%	8%	2%	15%	4%	11%	3%
Bosnia	10%	3%	7%	2%	12%	3%	8%	2%
Bulgaria	15%	4%	12%	3%	44%	11%	28%	7%
Chile	15%	4%	6%	2%	18%	4%	7%	2%
Colombia	20%	5%	21%	5%	23%	6%	24%	6%
Czech Republic	12%	3%	9%	2%	12%	3%	9%	2%
Congo, Dem. Rep.	19%	6%	15%	5%	31%	10%	20%	7%
Ecuador	6%	1%	5%	1%	6%	1%	5%	1%
El Salvador	12%	3%	11%	3%	17%	4%	14%	3%
Georgia	28%	6%	9%	2%	48%	10%	24%	5%
Ghana	68%	11%	52%	9%	77%	13%	58%	10%
Guatemala	7%	2%	3%	1%	21%	5%	8%	2%
Honduras	15%	4%	2%	0%	16%	4%	3%	1%
Hungary	12%	3%	12%	3%	16%	4%	13%	3%
Kenya	17%	3%	11%	2%	41%	7%	23%	4%
Kosovo	30%	7%	29%	7%	86%	22%	92%	23%
Kyrgyz	34%	8%	29%	7%	36%	9%	30%	8%
Lao, PDR	9%	3%	6%	2%	9%	3%	6%	2%
Latvia	27%	7%	24%	6%	32%	8%	30%	7%
Lithuania	20%	5%	16%	4%	20%	5%	16%	4%
Macedonia	2%	0%	1%	0%	2%	1%	2%	0%
Mexico	40%	10%	21%	5%	53%	13%	35%	9%
Moldova	9%	2%	12%	3%	11%	3%	14%	3%
Mongolia	7%	2%	5%	1%	34%	8%	23%	6%
Montenegro	10%	2%	9%	2%	10%	2%	9%	2%
Nepal	13%	3%	11%	3%	14%	3%	11%	3%
Nicaragua	14%	3%	8%	2%	21%	5%	13%	3%
Panama	14%	4%	17%	4%	15%	4%	18%	4%
Paraguay	10%	3%	7%	2%	11%	3%	7%	2%
Peru	7%	2%	7%	2%	20%	5%	20%	5%
Poland	8%	2%	6%	1%	9%	2%	7%	2%
Romania	13%	3%	10%	3%	14%	3%	11%	3%
Rwanda	33%	7%	25%	5%	34%	7%	26%	5%
Serbia	16%	4%	17%	4%	19%	5%	19%	5%
Slovak Republic	14%	3%	15%	4%	14%	3%	15%	4%
Slovenia	13%	3%	17%	4%	17%	4%	19%	5%
Tanzania	6%	1%	6%	1%	22%	3%	13%	2%

Uganda	3%	0%	1%	0%	7%	1%	21%	3%
Ukraine	14%	3%	10%	2%	18%	4%	13%	3%
Uruguay	7%	2%	7%	2%	7%	2%	7%	2%
Uzbekistan	14%	3%	16%	3%	32%	6%	34%	7%
Yemen	38%	10%	18%	4%	42%	11%	20%	5%
Zambia	17%	3%	17%	3%	25%	4%	23%	4%

The annualized estimates of job loss associated with firm exit ranges from less than 1% per annum for Uganda, Macedonia, Honduras, Belarus, Tanzania, and Guatemala to a high of about 9% for Ghana. Estimates based on our less conservative measure of exit, the *weak_exit*, are broadly similar to estimates based on the *strict_exit* measures of exit. Only in five of the countries do the estimates of annualized exit rate based on *strict_exit* and *weak_exit* differ by four or more percentage points. Similarly, the estimates of the annualized job loss based on the *weak_exit* are very close to estimate reported based on the *strict_exit*.

In terms of firm size, for slightly over half of the countries in our sample, the largest share of job loss based on the strict exit comes from small and medium enterprise, defined as firms with employee of 5 to 99 (see Figure 1). In Kosovo, for instance, of the annualized job loss rate of 7% between 2009 and 2013, 6% is from medium and small enterprises while the remaining 1% is from large enterprises. Similarly, for Yemen, of the total job loss of about 4.4% between 2010 and 2013, about 4% is from SMEs and just less than 1% from large firms.

Figures 2 and 3 additionally show the relative share of firms exiting the market and jobs lost due to firm exit for SMEs (figure 2 shows a cut-off of SMEs as less than 100 employees, figure 3 with a cut-off of 250 employees). In both graphs, the x-axis shows the share of exiting firms that are represented by SMEs; countries plotted to the right of the vertical red line thus show that a majority of exiting firms are SMEs. Meanwhile, the vertical y-axis shows the proportion of job losses accounted for by SMEs, with points plotted above the horizontal red line indicating that a majority of exiting-firm job loss was due to SMEs leaving the market. In all countries, regardless of the cut-off, SMEs account for the vast majority of firms exiting the market (indicated by countries to the right of the vertical red line). In terms of the relative share of jobs lost, however, the pattern is not as clear; in several countries, indicated by a location below the horizontal red line, SMEs account for less than half of the share of private-sector jobs lost due to firm exit, indicating heterogeneity across countries,

in a pattern that is somewhat contradictory to that examined in developed-world economies (for example, Haltiwanger (2012) and Eslava and Haltiwanger (2014)) on the relative role of SMEs in job destruction and firm dynamics. This pattern is further sensitive to the cut-off used: while the pattern in figure 2 is more ambiguous, figure 3 displays a pattern whereby both the vast majority of exiting firms and job losses are constituted among firms with 250 or fewer employees.

How do these estimates compare to those reported in similar studies? Although strict comparison is difficult owing to diversity in method and data used and periods covered in the various studies, it may be worth comparing the exit rates reported in similar studies where available. Pavcnik (2002) finds an annual rate of 5% exit for manufacturers in Chile over the period 1979 to 1986. Meanwhile, Bartelsman et al (2004) report firm entry and exit rates for a broader set of mostly OECD countries, based on either census or sample data. For Colombia and Chile, based on manufacturing census data, they report exit rate of about 4% per annum over the period 1989 to 1999¹¹. Although their estimate for Chile is roughly similar to ours, the estimate for Colombia is twice what we report in this paper. They also report estimates for Argentina over the period 1997 to 1999, revealing an exit rate of about 4.5 percent per annum for broader sector of the economy (and 4% for manufacturing firms), almost four times the estimates we report in this paper. Their estimates for Mexico of 4% exit rate per annum over the period 1989 to 1999, however, is almost half what we report in this paper. Similarly our estimates for Romania and Slovenia are roughly comparable to what they report for these two countries over the period 1996 to 1999. Using a panel data of about 200 firms per country, Söderbom et al. (2006) report exit rates of about 5% for Kenya and about 9% for Tanzania over the period 1994 to 1999. Although our estimate for Kenya is far lower, that of Tanzania is almost similar. All in all, the rough comparison reveals that our estimates of exit are slightly more conservative, as we discuss above.

Estimation of predictors of firm exit

We analyze the predictors of firm exit by estimating the following model from equation (1), where x is a function of various firm- (F), market- (L) and country-level factors (C, R), written as:

$$x = f(F, L, C) \quad (2)$$

Resulting in a general estimation of:

¹¹ Period for Colombia survey is between 1989 to 1997

$$\text{Pr}[ext]_{t+n} = \alpha + \beta_1 \gamma_t + \beta' F'_{it} + \beta' L'_{mt} + \beta' C'_t + \beta' C'_{(t,t+n)} + \beta' R' + \epsilon_h \quad (3)$$

Where the probability of firm exit (ext)¹² at the time of the second survey round ($t+n$) is determined by firm productivity (γ), a vector of characteristics of firm i at time t (F'_{it}), vector of market-level indicators (L'_{mt}) at a firm's market (m), and a vector of country-level characteristics (C') including indicators at both time t and averaged over the ensuing period (t to $t+n$); additionally, we include a vector of country, year, and sector fixed effects (R'), removing country fixed effects to adjust for perfect collinearity with elements of C' .

The list of variables included in the regression is guided by the discussion in section II¹³. We control for nine firm-level variables. Productivity is the key firm-level variable controlled for in the regression. Besides being an important determinant of exit by itself, this variable serves as an indication of the existence of creative destruction. As noted, inferring the intensity of creative destruction based on the rates of firm exits rests on the assumption that only less productive firms exit the market. If exit is not related to firm productivity, exit rate may not necessarily indicate whether the process of creative destruction is at work or not.

We use the (log of) labor productivity, measured by the ratio of real sales to total workforce, as a proxy for productivity, expressed in 2005 USD. While several other efforts use additional measures for productivity, including single-stage and two-stage TFP as well as various methods to account for the endogeneity and lumpiness of capital purchases, full inputs are only available for manufacturing firms in the ES data. Additionally, we lack comparable data for industry (sector) or price deflators to fully explore several TFP measures. Rather than sacrifice the breadth of our coverage and omit the sample of service-sector firms, we use the simpler labor productivity measure.¹⁴ This is consistent with approaches taken elsewhere analyzing developing economies, and we assume our labor productivity measure to be generally correlated with TFP (for a recent example, see Hallward-

¹² Firm and country subscripts are omitted to avoid cluttering the notation.

¹³ The full list of right-hand-side variables is described in table 5. All data are firm-level and from the Enterprise Surveys unless otherwise indicated.

¹⁴ Such measures are not without their own problems, for a full discussion see Foster et al (2008).

Driemeier and Rijkers (2013)¹⁵). Even so, we restrict our discussion below to the sign and significance of the observed effect rather than discuss the magnitude of the effect, accordingly.

In addition to productivity, we also control for several other firm-level regressors in our specification. Several of these firm-level variables are taken from the ES data and correspond to values in the initial-round of survey (t). We control for the age of a firm, measured by the year of the first round survey minus the year in which the firm started operations; the size of the firm, measured by (log of) the total employees during the first round of survey; the legal structure of the firm, measured by a dummy variable taking a value of 1 if the firm has limited liability and zero otherwise; ownership structure, capturing whether the firm is foreign-owned and whether there are female among its owners; exporting status, measured by whether the firm exports at least 10% of its total sales; access to external finance, measured by the usage of bank financing for working capital and/or fixed investment; and (log of) manager's experience, measured by manager's years of experience in similar industry.

As a second set of covariates, we include measures of local-market indicators to approximate the effect of meso-level market variables. First, we capture the level of competition in the local market by the variable *comp*, given by the collapsed, weighted count of firms by location and industry (2-digit ISIC code) within a country. We further use *comp* as a proxy for firm market share and thus capacity for pricing as a mechanism to absorb shocks and stay in business. Secondly, as we anticipate a firm's relative productivity to its within-country competitors to matter, we include the country-sector¹⁶ mean level of (log) sales per worker as a proxy for the (labor) productivity of a firm's competition.

Finally, we also include sector- as well as country-level variables in the regression. Sector is broadly defined to indicate whether the firm is in manufacturing, retail or other services. We control for five country-level variables¹⁷ - initial GDP per capita, GDP growth (over the period between survey rounds), openness – as measured by imports and exports as % of GDP, and measures of ease of entry and exit based on the Doing Business Indicators. Thus, we control for the, in effect, lagged state of

¹⁵ Hallward-Driemeier and Rijkers (2013) use value-added per worker, a widely used alternate definition of labor productivity, as well as several comparisons for robustness using alternate TFP measures. The ES data have limited cost variables for service firms and so we utilize a simpler sales per worker measure.

¹⁶ Due to issues of sample coverage and survey design, we estimate these averages over broadly defined sectors: manufacturing, retail, and other services.

¹⁷ Some of the country-level variables account for the period average in the years between rounds and the aggregate business environment.

the economy by including several variables at time t (i.e., the year of the first-wave survey) as they relate to the probability of exit by time $t + n$, as well as a proxy for shocks and the business cycle to each economy in the form of GDP growth over the interim period. Such shocks are also controlled for somewhat by our inclusion of year controls as well as our controls for the number of interim years between survey rounds, n_year . Further, the latter two variables help capture the effect of excluded variables of regulation and its enforcements on firm survival, a unique point of analysis enabled by our repeated cross-sectional data.

Table 3 provides the list of all variables used in the regression; Table 4 reports the summary statistics for all the variables included in the regression, pooled across the 47 countries in the regression sample. The cumulative exit rate is about 16 percent based on our conservative measure of exit, the *strict_exit*, and 23% based on our less conservative measure of exit, the *weak_exit*. Real annual sales per worker, our measure of productivity, average at about 57,000 in 2005 US\$, which is by definition close to the estimated labor productivity of competitors in a firm's country-sector of \$58,000. Most of the firms in the analysis are relatively young, with an average age of just under 12 years, a fact that helps mitigate somewhat against incumbency bias concerns. Over a third of the firms reports having a female among their owners, while just over one in four firms reports having used a bank loan to finance fixed investment or working capital. Nine percent of the firms have foreign ownership, defined as firms with 10% or more owned by foreign firms or individuals. Exporting firms, defined as those with direct exports accounting for 10% or more of total annual sales, constitute about 11% of the total sample. In terms of legal structure, over 60% of the firms are of limited liability type, broadly defined to encompass shareholding (publically traded or not) and limited partnership companies; at first blush, this rate appears high but could be accounted for by the legal idiosyncrasies in certain countries, a fact controlled for by country-level fixed effects. About 38% of the firms in the sample are in the manufacturing sector, the remaining 62% being in service sector broadly defined (29% being in retail).

Table 4: Descriptive Statistics

Firm-level Variables

Variable	Mean	exp(mean)	Lin SE	N
strict_exit	0.16	n.a.	0.5%	22,824
weak_exit	0.23	n.a.	0.5%	22,824
Age (years)(log)	2.45	11.60	0.009	22,423
Labor productivity (05 USD)(log)	10.96	\$ 57,267.58	0.018	20,079
Female Ownership	0.37	n.a.	0.6%	22,364
Manager's Experience (yrs.)(log)	2.57	13.05	0.009	22,406
Bank financing	0.26	n.a.	0.5%	22,824
Exporter	0.11	n.a.	0.4%	22,824
Foreign Ownership	0.09	n.a.	0.4%	22,823
Limited Liability	0.60	n.a.	0.5%	22,824
Years between rounds (n_year)	4.32	n.a.	0.001	22,824
Manufacturing	0.38	n.a.	n.a.	22,824
Retail	0.29	n.a.	n.a.	22,824
Other Services	0.32	n.a.	n.a.	22,824
No. of competitors (log)	5.58	266.22	0.009	22,824
Labor prod. of competition (05 USD)(log)	10.97	\$ 58,192.98	0.003	22,824

Survey-weighted estimates

Economy-level Variables

Variable	Mean	exp(mean)	SD	N
GDP per capita (05 USD)(log)	7.81	\$ 2,465.44	0.163	47
GDP growth [t,t+n]	3.83	n.a.	0.419	47
Openness (% GDP)	83.23	n.a.	4.299	47
New-firm density	4.38	n.a.	1.494	37
Ease of entry (DB)	0.55	n.a.	0.045	47
Resolving insolvency	0.50	n.a.	0.042	47

* Based on percentile rank of DB "Distance to Frontier" measure; higher score indicates greater ease

Table 5 provides probit estimates of the likelihood that firms exit (strict_exit=1) the market in 47 economies in which there have been multiple, standardized Enterprise Surveys. Each of the estimations utilizes Stata's svy prefix, which takes advantage of the program's built-in survey options, and by default utilizes linearized, Taylor standard errors, incorporating survey weights and the ES's stratified survey design.¹⁸ To account for pooling data across several economies, survey weights are

¹⁸ For more information, the ES website includes a note on sampling methodology, here:

http://www.enterprisesurveys.org/~media/FPDKM/EnterpriseSurveys/Documents/Methodology/Sampling_Note.pdf

re-scaled to sum to 1, so that each economy is equally considered in the estimations. Each specification includes regional and year fixed effects (not shown), as well as the number of years, n_years , to account for the varying periods of time between survey rounds.

To address concerns of simultaneity with our *age* variable (tables 5 and 7), as a firm's incumbency in the market can likely affect characteristics such as its access to credit, and even ownership structure, tables 6 and 8 includes an *age_collapsed* variable, which is the collapsed mean of the age of within-cell firms. In general, the use of the cell-mean average to estimate age does not affect the observed relationships, for both the strict and weak measure; in particular firm productivity and age remain robust and highly significant.

Findings – Firm-specific Factors

Both a firm's age and its labor productivity are negative and highly statistically significant; incumbent and more productive firms are less likely to exit the market. This holds true across all of our specifications – using both definitions of exit – and when using the more conservative option of clustering standard errors on the country-level. This finding confirms widely-reported results of the correlation between age and firm survival seen in several studies analyzing both developed (e.g., Bernard and Jensen (2007) and developing economies (Bernard and Sjöholm (2003), Frazer (2005), Shiferaw (2009), Hallward-Driemeier and Rijkers (2013)).¹⁹

Interestingly, while firm size is consistently, negatively related to the likelihood of exit, indicating that larger firms are less likely to exit, this effect largely loses significance after accounting for firm productivity. This holds even when using our age instrument to control for likely endogeneity between firm size and age. Thus, we do not find a strong or consistently significant relationship between firm size and survival (unlike for example evidence from Frazer (2005), Mengistae (2006), Söderbom et al. (2006) or Shiferaw (2007); rather, our results add to a literature that is somewhat mixed.²⁰ In this sense, the fact that we do not find a consistent size effect – after taking into account firm age and productivity – in our wide-ranging, pooled dataset suggests that such observed size effects may be due to underlying heterogeneity among countries.

¹⁹ This finding, though, has not been universal: Söderbom et al (2006), for instance, find no or little relationship between firm age and exit.

²⁰ Bernard and Jensen (2007), for instance, find no significant evidence of a size effect on firm survival.

Together, the observation that firm age – along with productivity – matters, with a minimized effect from firm size, is an interesting complement to research elsewhere on the age-size lifecycle of firms (for a recent discussion see Ayyagar, Demirguc-Kunt and Maksimovic 2013). Some recent analysis including Haltiwanger et al. (2013) (for the United States) have challenged a long-held view that small firms are the largest engines of job growth, showing evidence that job growth effects may be mostly explained by age. Our mixed findings of the relationship between firm size and exit add to the need for further researching into firm survival particularly in developing economies (e.g., see Haltiwanger et al. 2012).

For firms with bank financing, either for fixed asset investment or for working capital, we also consistently observe a lower likelihood of exiting the market. Firms with limited liability are less likely to exit, a finding consistent across our specifications, providing a possible indication that firms' legal structure – and their capacity to shield themselves from potentially catastrophic losses – is more a mechanism of insulating incumbent firms rather than the promotion of risk-taking as seen in developed economies (such as reported by Harhoff et al (1998). These effects remain consistent, in magnitude and significance, after controlling for economy-level variables, including GDP and population at t_0 and growth, which itself is associated with a lower likelihood of firm exit.

Firms with at least 10% of foreign ownership are less likely to exit the market as well, underlining findings elsewhere (e.g. Bernard and Sjöholm (2003)). This may point to a dynamic whereby parent companies are able to support subsidiaries, as opposed to withdrawing from markets rapidly in times of distress. There are clear endogeneity issues with foreign ownership, however, that we do not fully account for – including, to name a few, the possibility that foreign investors may buy up the most productive firms or that the likelihood of subsidiary survival is certainly linked to the fortunes of parent companies abroad – and this is one area of potential future research.

We do not find evidence for the effects of two other factors related to the characteristics of ownership and management: firms with female participation in ownership do not face a higher likelihood of exit compared to fully-male-operated firms, nor do the years of a manager's experience matter for exit. The latter factor, in particular, is a possible area for future consideration, given that there may be little correlation between experience and managerial quality (Bloom et al (2012)) or perhaps it is in indication that firm incumbency matters more than the tenure of who is in charge.

One feature of the Enterprise Survey that we exploit is the inclusion of service-sector firms, which are omitted from analyses based on manufacturing censuses. We somewhat unexpectedly find

that retail firms are less likely to exit the market, perhaps a partial explanation for lower observed rates of exit in our sample are at least, in part, due to the inclusion of services.²¹ Given the array of several variables that are included and the fact that this result holds generally, the factors for exit among service firms specifically is another topic that may benefit from more research.

Market-level factors

We find mixed evidence for market-level factors as determinants of firm exit. Our proxy for competition in the market (*comp*), the number of establishments in a firm's industry and location, is negatively related to exit. While this may run counter to the argument that more competition from firms is likely to spurn creative destruction, it may also be an indication of several – necessarily incumbent – firms occupying markets that in themselves do not have high exit rates. In fact, after accounting for macro-level variables, our other market-level indicator for the productivity of competitors does have a positive and significant effect on firm exit. Put another way, firms facing more productive competitors are more likely to exit, all else equal, an indication that it is the quality of competitors and not the quantity which may indicate a greater force for firm survival, evidence that the quality of firm cohorts may have an effect on survival (Box (2008)).²²

Economy-level factors

We find evidence of macro-level factors on the likelihood of firm exit. External shocks, as represented by GDP growth, have significant effects on the likelihood of exit, with the chances of firm exit decreasing with economic growth. We find limited results for the effect of GDP per capita, losing significance in our more conservative estimations, though the direction of this effect is negative, indicating that in richer countries firm exit is less likely. Trade openness is associated with a lower chance of firm exit, indicating perhaps that the benefits of foreign trade, both direct and indirect, may mitigate firm exit.

Regarding the regulatory environment, our measure using the Doing Business's indicator on entry regulation is consistently and highly significant. A greater ease of entry, indicated by a higher score, is consistently related to a higher likelihood of exit. That is, in contrast to our measure for

²¹ As noted, most census based estimates are restricted to manufacturing firms.

²² This of course does not directly account for pricing power of firms in markets with few or no competitors.

incumbent competitors, our proxy for the ease of entry does indicate that lower ease of entry are conducive to creative destruction, proxied for by firm exit. Put a different way, all else equal, this suggests that in economies with more restrictive barriers, less productive firms are able to persist in the market. We also employ a second measure of new-firm entry, the *de facto* indicator of the number of new-firm entrants (per 1,000 people), utilizing the running average over the period between survey rounds. Again, we find further evidence that greater new-firm density is correlated with greater likelihood of firm exit, suggesting evidence of creative destruction. This finding backs results such as those in Dunne et al. (1989) and Cable and Schwalbach (1991), both of which report that higher exit rates are likely to be closely correlated with higher entry rates.

Lastly, we find limited evidence of the effect of resolving insolvency on firm exit. We observe sparse – and somewhat counterintuitive – evidence of a negative effect, but only when using our weak definition of exit. This effect indicates that where resolving insolvency is in fact easier, indicated by a higher score on the Doing Business distance to the frontier, is somewhat associated with lower exit rates. This runs counter to the argument that more accommodating insolvency regimes are associated with market conditions, including through the mechanism of new entrants to the market, increasing a firm’s likelihood of exit. Rather, such bankruptcy regimes may be associated with firms being able to weather adverse shocks and remain operating in the market. We only find weak evidence of this effect, and further research would be needed to understand it more completely.

As a robustness check, we estimate the probit equation using country-level, clustered standard errors, which provide a more conservative measure of variance and the results (not reported here) remain the same.

V. Conclusion

Schumpeterian creative destruction, through the churning of the market via the entry of new firms and the exit of less productive ones, has been widely regarded as an economy-wide driver of productivity. While census-based and selective, survey-based efforts have attempted to measure both entry, and to a lesser extent, firm exit, this approach has still not been widely and consistently applied, with the notable exception of some measures of firm entry.

We provide estimates of the patterns and predictors of firm exit using a unified and harmonized data methodology for 47 economies. By relying on such survey data, we leverage a singular methodology, with a well-defined universe of inference and are able to provide cross-economy comparisons, including estimates of the effects of macro-level variables, including the regulatory environment. We find evidence consistent with results well-established in the literature, but for a broader range of economies, suggesting that the use of comparatively small, representative surveys may provide a viable opportunity for further research. This approach appears to be widely applicable, particularly when compared to the feasibility of coordinating and scaling up census-based data collection efforts. However, while the use of ES data enables such comparisons, we adopt a necessarily conservative approach, due to the considerations of the difficulty of data collection by the collection of survey samples, in periodic waves. As such, we find estimates for firm exit and job loss that tend to fall below comparative estimates from census- and registry-based studies; this likely indicates that survey-based approaches to firm exit can be considered as lower bounds of firm exit.

One particular strength from our approach is the possibility of systematic cross-country research. We exploit measures for barriers to entry and exit as a logical first-effort: further cross-country analysis utilizing additional topic areas will surely be needed. This agenda should also include further refinement of data measurement of firm exit, including building on ongoing, continuous data collection efforts such as the ES and other globally comparable data sets. Additional research will benefit from multi-wave panels, including the observations of several economies over more-frequent and heterogeneous external conditions, as well as further integration of exit measures with data entry.

Figure 1: Annualized Job loss rate (based on the strict exit) over the period between the two rounds of survey, by firm Size

Figure 2: Job Loss and Firm Exit Rates, Relative Share of SMEs (less than 100 employees)

Figure 3: Job Loss and Firm Exit Rates, Relative Share of SMEs (less than 250 employees)

Table 3: Variables and Descriptions

Variable	Description
<i>labor productivity</i>	the (log of) annual sales revenues divided by the number of full-time permanent employees. All values are deflated to 2005 USD.
<i>Log(Size)</i>	the (log of) total number of employment in year t .
<i>Log(Age)</i>	is the (log of) the number of years that the firm has been in operation. Due to concerns that other co-variables may be endogenous with age we also utilize a second variable, age collapsed, which is the collapsed, weighted average of age within each economy-sector (manufacturing, retail, or other services) combination.
<i>female ownership</i>	takes value of 1 if there is female participation in ownership
<i>bank financing</i>	takes a value of 1 if a firm reports non-zero values for bank financing of working capital and/or fixed-asset investment
<i>Limited liability</i>	A dummy variable taking a value of 1 if the firm is a limited liability company, and zero otherwise.
<i>Exporter</i>	indicates if a firm has exports that represents at least 10% of its annual sales
<i>Foreign</i>	indicates if a firm has at least 10% foreign ownership
<i>labor productivity (competitors)</i>	is the weighted, collapsed average of labor productivity within a firm's sector-country. For coverage issues, sector is widely defined here as manufacturing, retail, and other services.
<i>retail</i>	takes a value of 1 if a firm is in the retail sector
<i>services</i>	takes a value of 1 if a firm is in selected services sectors, excluding retail
<i>GDP per capita</i>	the (log of) an economy's GDP per capita at the time of the first survey round, in 2005 USD (source: World Development Indicators)
<i>GDP growth</i>	the running average of an economy's GDP growth in the years between survey rounds (source: World Development Indicators)
<i>Openness</i>	the sum of exports and imports of an economy, both expressed as % of GDP in the year corresponding to the initial survey round (source: World Development Indicators)
<i>Ease of entry (DB)</i>	the simple running average of the World Bank's Doing Business indicators for "Starting a Business", using the DTF indicator over the years between the survey rounds, coded that a higher rank indicates higher ease of entry (source: Doing Business, www.doingbusiness.org)
<i>Resolving insolvency (DB)</i>	the simple running average of the World Bank's Doing Business indicators for "Resolving Insolvency", using the DTF indicator over the years between the survey rounds, coded that a higher rank indicates higher ease of exit in terms of proceeding through bankruptcy.
<i>New-firm density</i>	Number new businesses (LLCs) per 1000 people, running average over period between surveys. Source: WDI (http://econ.worldbank.org/research/entrepreneurship) ²³
<i>comp</i>	Is the weighted number of estimated establishments in a firm's industry (by 2-digit ISIC code) and location of stratification, based on ES design information, and is considered a proxy for the number of competitors in a firm's market.

²³ For Moldova, due to missing values the 5-yr. running average is used, as opposed to the 4-yr. average. Data not available for the DRC, Ecuador, Honduras, Kenya, Mongolia, Nicaragua, Paraguay, Poland, Tanzania, and Yemen. Due to coverage issues, results using this co-variate should be interpreted with the caveat that full surveys are not included due to missing macro-variables.

Table 5: Probit estimation results using *strict_exit* as the dependent variable

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Size (log)	-0.068*** 0.018	-0.049** 0.019	-0.026 0.019	-0.017 0.019	-0.018 0.02	-0.008 0.021	-0.011 0.021	-0.01 0.021	-0.015 0.02	-0.009 0.02	-0.004 0.023	-0.017 0.02
Retail	-0.158*** 0.047	-0.157*** 0.048	-0.149*** 0.051	-0.151*** 0.052	-0.158*** 0.052	-0.164*** 0.053	-0.122** 0.06	-0.153** 0.066	-0.108** 0.055	-0.151*** 0.056	-0.1 0.063	-0.113** 0.054
Services	-0.095* 0.052	-0.097* 0.052	-0.092 0.057	-0.093 0.058	-0.088 0.058	-0.094 0.059	-0.069 0.061	-0.099 0.071	-0.047 0.059	-0.056 0.059	-0.068 0.063	-0.052 0.058
Limited liability	-0.193*** 0.053	-0.203*** 0.053	-0.202*** 0.055	-0.204*** 0.056	-0.204*** 0.056	-0.194*** 0.057	-0.197*** 0.057	-0.199*** 0.057	-0.166*** 0.05	-0.235*** 0.051	-0.110* 0.058	-0.164*** 0.05
n_years	-0.128** 0.061	-0.146** 0.062	-0.176*** 0.065	-0.162** 0.067	-0.172** 0.068	-0.167** 0.068	-0.179*** 0.068	-0.142* 0.078	-0.091*** 0.03	-0.183*** 0.036	-0.121*** 0.038	-0.076** 0.032
Age (years)(log)		-0.103*** 0.028	-0.118*** 0.03	-0.127*** 0.03	-0.115*** 0.032	-0.119*** 0.032	-0.121*** 0.032	-0.121*** 0.032	-0.125*** 0.031	-0.113*** 0.031	-0.144*** 0.035	-0.126*** 0.031
Labor productivity (05 USD)(log)			-0.055*** 0.017	-0.046*** 0.017	-0.045*** 0.017	-0.042** 0.017	-0.041** 0.017	-0.044** 0.017	-0.037** 0.016	-0.035** 0.016	-0.040** 0.02	-0.037** 0.016
Female ownership				0.036 0.045	0.035 0.045	0.031 0.045	0.033 0.045	0.034 0.045	0.041 0.045	0.027 0.045	0.093* 0.052	0.044 0.045
Bank financing				-0.126** 0.057	-0.138** 0.058	-0.141** 0.058	-0.145** 0.058	-0.146** 0.058	-0.207*** 0.053	-0.205*** 0.053	-0.168*** 0.06	-0.205*** 0.053
Yrs. of manager's experience (log)					-0.03 0.033	-0.03 0.033	-0.029 0.033	-0.029 0.033	-0.02 0.033	-0.022 0.033	-0.04 0.034	-0.021 0.033
Exporter						-0.043 0.075	-0.048 0.074	-0.048 0.074	-0.104 0.073	-0.094 0.073	-0.124 0.08	-0.103 0.072
Foreign						-0.163** 0.075	-0.164** 0.075	-0.164** 0.075	-0.161** 0.08	-0.176** 0.078	-0.132 0.092	-0.159** 0.08
No. of competitors (log)							-0.036* 0.02	-0.035* 0.02	-0.060*** 0.015	-0.043*** 0.016	-0.047*** 0.018	-0.055*** 0.015
Labor productivity (log) of competitors								0.085 0.086	0.167*** 0.02	0.171*** 0.02	0.164*** 0.024	0.163*** 0.02
GDP per capita (05 USD)(log)									-0.042 0.032	-0.120*** 0.033	-0.075** 0.038	-0.015 0.037
GDP growth [t,t+n] (05 USD)(log)									-0.036*** 0.009	-0.043*** 0.009	-0.029** 0.013	-0.036*** 0.009
Trade openness (% of GDP)									-0.001 0.001	-0.003*** 0.001	-0.001 0.001	-0.001 0.001
Ease of entry (DB, DTF)										1.013*** 0.114		
New-firm density (log)											0.011*** 0.003	
Resolving insolvency (DB, DTF)												-0.166 0.122
Cons	-0.587* 0.347	-0.272 0.362	0.428 0.431	0.254 0.443	0.358 0.458	0.295 0.458	0.551 0.47	-0.497 1.161	-0.570* 0.328	0.066 0.353	-0.22 0.412	-0.738** 0.35
N	22,716	22,338	19,791	19,473	19,224	19,223	19,223	19,223	19,223	19,223	15,124	19,223
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
N economies	47	47	47	47	47	47	47	47	47	47	37	47

* sig. at 10% level; ** sig at 5% level; *** sig at 1% level.

Survey-weighted estimates with linearized, Taylor S.E.s. For year fixed effects, 2006 is omitted (not shown). The base case is defined as a privately held company, which is domestically owned and exports less than 10% of its annual sales.

Table 6: Probit estimation results using *strict_exit* as the dependent variable (instrumenting age by its mean)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Size (log)	-0.068*** 0.018	-0.050*** 0.019	-0.026 0.019	-0.018 0.019	-0.019 0.02	-0.009 0.021	-0.012 0.021	-0.011 0.021	-0.015 0.02	-0.01 0.02	-0.003 0.023	-0.017 0.02
Retail	-0.158*** 0.047	-0.163*** 0.048	-0.152*** 0.051	-0.153*** 0.052	-0.161*** 0.052	-0.167*** 0.053	-0.128** 0.059	-0.159** 0.065	-0.112** 0.055	-0.156*** 0.055	-0.105* 0.062	-0.118** 0.054
Services	-0.095* 0.052	-0.103** 0.052	-0.096* 0.057	-0.096* 0.058	-0.091 0.058	-0.097* 0.059	-0.073 0.061	-0.104 0.071	-0.05 0.058	-0.06 0.059	-0.072 0.063	-0.055 0.058
Limited liability	-0.193*** 0.053	-0.202*** 0.053	-0.204*** 0.055	-0.206*** 0.056	-0.206*** 0.056	-0.196*** 0.057	-0.199*** 0.057	-0.201*** 0.056	-0.167*** 0.049	-0.236*** 0.051	-0.112* 0.058	-0.165*** 0.05
n_years	-0.128** 0.061	-0.147** 0.062	-0.179*** 0.065	-0.165** 0.067	-0.177*** 0.068	-0.172** 0.068	-0.184*** 0.068	-0.146* 0.077	-0.092*** 0.029	-0.184*** 0.036	-0.124*** 0.038	-0.076** 0.032
Age instrument (years)(log)		-0.152*** 0.042	-0.182*** 0.045	-0.196*** 0.046	-0.175*** 0.048	-0.180*** 0.048	-0.183*** 0.049	-0.183*** 0.049	-0.194*** 0.047	-0.176*** 0.047	-0.222*** 0.053	-0.195*** 0.047
Labor productivity (05 USD)(log)			-0.055*** 0.017	-0.047*** 0.017	-0.046*** 0.017	-0.042** 0.017	-0.042** 0.017	-0.044** 0.017	-0.037** 0.016	-0.035** 0.016	-0.040** 0.02	-0.038** 0.016
Female ownership				0.04 0.045	0.039 0.045	0.035 0.045	0.037 0.045	0.038 0.045	0.043 0.045	0.029 0.045	0.096* 0.051	0.046 0.045
Bank financing				-0.125** 0.057	-0.136** 0.057	-0.139** 0.057	-0.143** 0.057	-0.144** 0.057	-0.206*** 0.052	-0.203*** 0.053	-0.166*** 0.059	-0.203*** 0.052
Yrs. of manager's experience (log)					-0.038 0.033	-0.038 0.033	-0.037 0.033	-0.037 0.033	-0.027 0.032	-0.028 0.033	-0.048 0.034	-0.028 0.032
Exporter						-0.046 0.074	-0.051 0.074	-0.051 0.074	-0.105 0.073	-0.096 0.073	-0.126 0.08	-0.104 0.072
Foreign						-0.162** 0.074	-0.163** 0.075	-0.162** 0.075	-0.160** 0.08	-0.175** 0.078	-0.13 0.092	-0.159** 0.08
No. of competitors (log)						-0.035* 0.02	-0.034* 0.02	-0.059*** 0.015	-0.042*** 0.016	-0.042*** 0.018	-0.046*** 0.018	-0.054*** 0.015
Labor productivity (log) of competitors							0.087 0.085	0.166*** 0.02	0.171*** 0.02	0.163*** 0.024	0.163*** 0.02	
GDP per capita (05 USD)(log)								-0.042 0.032	-0.119*** 0.033	-0.076** 0.038	-0.014 0.036	
GDP growth [t,t+n] (05 USD)(log)								-0.036*** 0.009	-0.043*** 0.009	-0.030** 0.013	-0.037*** 0.009	
Trade openness (% of GDP)								-0.001 0.001	-0.003*** 0.001	-0.001 0.001	-0.001 0.001	
Ease of entry (DB, DTF)										1.008*** 0.114		
New-firm density (log)											0.011*** 0.003	
Resolving insolvency (DB, DTF)												-0.173 0.122
Cons	-0.587* 0.347	-0.06 0.382	0.707 0.449	0.557 0.462	0.656 0.472	0.601 0.472	0.853* 0.482	-0.225 1.165	-0.26 0.337	0.348 0.36	0.157 0.424	-0.434 0.358
N	22,716	22,437	19,869	19,546	19,296	19,295	19,295	19,295	19,295	19,295	15,182	19,295
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
N economies	47	47	47	47	47	47	47	47	47	47	37	47

* sig. at 10% level; ** sig at 5% level; *** sig at 1% level.

Survey-weighted estimates with linearized, Taylor S.E.s. For year fixed effects, 2006 is omitted (not shown). The base case is defined as a privately held company, which is domestically owned and exports less than 10% of its annual sales.

Table 7: Probit estimation results using *weak_exit* as the dependent variable

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Size (log)	-0.087*** 0.018	-0.068*** 0.018	-0.049*** 0.018	-0.044** 0.019	-0.044** 0.019	-0.037* 0.02	-0.038* 0.02	-0.038* 0.02	-0.036* 0.019	-0.033* 0.019	-0.017 0.022	-0.041** 0.019
Retail	-0.106** 0.044	-0.113** 0.044	-0.102** 0.047	-0.102** 0.048	-0.101** 0.048	-0.102** 0.049	-0.086 0.055	-0.116* 0.06	-0.064 0.05	-0.090* 0.051	-0.09 0.058	-0.083* 0.05
Services	-0.078 0.05	-0.08 0.05	-0.08 0.055	-0.086 0.055	-0.082 0.056	-0.084 0.056	-0.074 0.058	-0.106 0.066	0.007 0.053	0.001 0.053	-0.049 0.06	-0.012 0.053
Limited liability	-0.202*** 0.05	-0.211*** 0.05	-0.194*** 0.053	-0.198*** 0.054	-0.199*** 0.054	-0.191*** 0.055	-0.192*** 0.055	-0.194*** 0.054	-0.220*** 0.045	-0.265*** 0.047	-0.114** 0.056	-0.209*** 0.046
n_years	-0.032 0.052	-0.05 0.053	-0.09 0.056	-0.079 0.057	-0.089 0.058	-0.083 0.058	-0.088 0.058	-0.05 0.068	-0.025 0.027	-0.070** 0.029	-0.169*** 0.037	0.029 0.03
Age (years)(log)		-0.114*** 0.026	-0.127*** 0.027	-0.134*** 0.028	-0.120*** 0.03	-0.124*** 0.03	-0.124*** 0.03	-0.125*** 0.03	-0.124*** 0.029	-0.115*** 0.029	-0.134*** 0.033	-0.127*** 0.029
Labor productivity (05 USD)(log)			-0.058*** 0.015	-0.051*** 0.016	-0.052*** 0.015	-0.049*** 0.016	-0.049*** 0.016	-0.052*** 0.016	-0.036** 0.015	-0.034** 0.015	-0.038** 0.019	-0.037** 0.015
Female ownership				0.01 0.042	0.013 0.042	0.009 0.042	0.01 0.042	0.011 0.042	-0.016 0.042	-0.023 0.042	0.035 0.048	-0.008 0.042
Bank financing				-0.068 0.053	-0.074 0.053	-0.078 0.053	-0.079 0.053	-0.081 0.053	-0.176*** 0.049	-0.176*** 0.049	-0.167*** 0.056	-0.167*** 0.049
Yrs. of manager's experience (log)					-0.029 0.03	-0.029 0.03	-0.028 0.03	-0.029 0.03	0.005 0.03	0.005 0.03	-0.018 0.032	0.002 0.03
Exporter						-0.002 0.069	-0.003 0.068	-0.002 0.068	-0.091 0.065	-0.085 0.064	-0.078 0.074	-0.088 0.064
Foreign						-0.135* 0.073	-0.135* 0.073	-0.136* 0.073	-0.183** 0.075	-0.191** 0.075	-0.150* 0.088	-0.178** 0.075
No. of competitors (log)							-0.014 0.019	-0.013 0.019	-0.058*** 0.014	-0.048*** 0.014	-0.019 0.016	-0.040*** 0.013
Labor productivity (log) of competitors								0.088 0.079	0.114*** 0.019	0.117*** 0.019	0.157*** 0.024	0.103*** 0.019
GDP per capita (05 USD)(log)									0.019 0.028	-0.028 0.029	-0.128*** 0.036	0.113*** 0.034
GDP growth [t,t+n] (05 USD)(log)									0.006 0.008	0.003 0.009	-0.045*** 0.012	0.002 0.008
Trade openness (% of GDP)									-0.003*** 0.001	-0.004*** 0.001	-0.003*** 0.001	-0.003*** 0.001
Ease of entry (DB, DTF)										0.608*** 0.097		
New-firm density (log)											0.038*** 0.004	
Resolving insolvency (DB, DTF)												-0.600*** 0.11
Cons	-0.897*** 0.316	-0.549* 0.329	0.229 0.391	0.088 0.403	0.2 0.417	0.145 0.418	0.247 0.428	-0.842 1.068	-0.636** 0.302	-0.284 0.31	0.679* 0.407	-1.226*** 0.334
N	22,716	22,338	19,791	19,473	19,224	19,223	19,223	19,223	19,223	19,223	15,124	19,223
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
N economies	47	47	47	47	47	47	47	47	47	47	37	47

* sig. at 10% level; ** sig at 5% level; *** sig at 1% level.

Survey-weighted estimates with linearized, Taylor S.E.s. For year fixed effects, 2006 is omitted (not shown). The base case is defined as a privately held company, which is domestically owned and exports less than 10% of its annual sales.

Table 8: Probit estimation results using *weak_exit* as the dependent variable (instrumenting age by its mean)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Size (log)	-0.087*** 0.018	-0.069*** 0.018	-0.050*** 0.018	-0.044** 0.019	-0.044** 0.019	-0.038* 0.02	-0.039* 0.02	-0.039* 0.02	-0.036* 0.019	-0.033* 0.019	-0.017 0.022	-0.041** 0.019
Retail	-0.106** 0.044	-0.119*** 0.044	-0.105** 0.047	-0.105** 0.048	-0.105** 0.048	-0.106** 0.049	-0.091 0.055	-0.121** 0.06	-0.069 0.05	-0.095* 0.05	-0.096* 0.058	-0.087* 0.05
Services	-0.078 0.05	-0.085* 0.05	-0.084 0.054	-0.089 0.055	-0.085 0.056	-0.087 0.056	-0.077 0.058	-0.110* 0.066	0.002 0.053	-0.003 0.053	-0.0540 0.06	-0.016 0.053
Limited liability	-0.202*** 0.05	-0.212*** 0.05	-0.197*** 0.053	-0.200*** 0.053	-0.202*** 0.054	-0.193*** 0.054	-0.194*** 0.054	-0.197*** 0.054	-0.222*** 0.045	-0.267*** 0.046	-0.117** 0.055	-0.211*** 0.046
n_years	-0.032 0.052	-0.051 0.053	-0.093* 0.055	-0.082 0.057	-0.093 0.058	-0.088 0.058	-0.093 0.058	-0.054 0.068	-0.026 0.027	-0.071** 0.029	-0.171*** 0.037	0.029 0.03
Age instrument (years)(log)		-0.171*** 0.039	-0.196*** 0.042	-0.207*** 0.042	-0.184*** 0.045	-0.188*** 0.045	-0.189*** 0.045	-0.189*** 0.045	-0.199*** 0.043	-0.185*** 0.043	-0.210*** 0.05	-0.203*** 0.043
Labor productivity (05 USD)(log)			-0.058*** 0.015	-0.051*** 0.015	-0.052*** 0.015	-0.050*** 0.016	-0.049*** 0.016	-0.052*** 0.016	-0.036** 0.015	-0.034** 0.015	-0.038** 0.019	-0.038** 0.015
Female ownership				0.011	0.013	0.01	0.011	0.012	-0.014	-0.021	0.037	-0.007
Bank financing				0.041	0.042	0.042	0.042	0.042	0.041	0.042	0.048	0.042
Yrs. of manager's experience (log)				-0.067 0.053	-0.072 0.053	-0.077 0.053	-0.078 0.053	-0.079 0.053	-0.175*** 0.049	-0.175*** 0.049	-0.166*** 0.056	-0.166*** 0.048
Exporter					-0.035 0.03	-0.036 0.03	-0.035 0.03	-0.036 0.03	0.001 0.03	0.001 0.03	-0.024 0.032	-0.003 0.029
Foreign						-0.004 0.068	-0.006 0.068	-0.005 0.068	-0.093 0.064	-0.087 0.064	-0.081 0.074	-0.089 0.064
No. of competitors (log)						-0.133* 0.073	-0.133* 0.073	-0.134* 0.073	-0.183** 0.075	-0.190** 0.074	-0.148* 0.088	-0.177** 0.075
Labor productivity (log) of competitors							-0.014 0.019	-0.012 0.019	-0.057*** 0.013	-0.047*** 0.014	-0.018 0.016	-0.040*** 0.013
GDP per capita (05 USD)(log)								0.09 0.079	0.114*** 0.019	0.116*** 0.019	0.157*** 0.024	0.102*** 0.019
GDP growth [t,t+n] (05 USD)(log)									0.02 0.028	-0.027 0.029	-0.128*** 0.036	0.115*** 0.033
Trade openness (% of GDP)									0.006 0.008	0.002 0.008	-0.046*** 0.012	0.002 0.008
Ease of entry (DB, DTF)									-0.003*** 0.001	-0.004*** 0.001	-0.003*** 0.001	-0.003*** 0.001
New-firm density (log)										0.606*** 0.097		
Resolving insolvency (DB, DTF)											0.038*** 0.004	
Cons	-0.897*** 0.316	-0.304 0.347	0.53 0.409	0.409 0.421	0.508 0.43	0.461 0.431	0.559 0.44	-0.548 1.072	-0.324 0.31	0.007 0.318	1.024** 0.417	-0.915*** 0.342
N	22,716	22,437	19,869	19,546	19,296	19,295	19,295	19,295	19,295	19,295	15,182	19,295
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
N economies	47	47	47	47	47	47	47	47	47	47	37	47

* sig. at 10% level; ** sig at 5% level; *** sig at 1% level.

Survey-weighted estimates with linearized, Taylor S.E.s. For year fixed effects, 2006 is omitted (not shown). The base case is defined as a privately held company, which is domestically owned and exports less than 10% of its annual sales.

Annex Table 1: Countries included and Sample size

	1st Round	2nd Round	Years between	n	Est. number of represented firms
Argentina	2006	2010	4	1,063	27,031.9
Armenia	2009	2013	4	374	1,221.5
Azerbaijan	2009	2013	4	380	2,200.4
Belarus	2008	2013	5	273	27,019.8
Bolivia	2006	2010	4	613	6,171.6
Bosnia	2009	2013	4	361	6,947.8
Bulgaria	2009	2013	4	288	33,186.0
Chile	2006	2010	4	1,017	12,550.5
Colombia	2006	2010	4	1,000	18,443.3
Czech	2009	2013	4	250	40,211.0
DRC	2010	2013	3	359	962.4
Ecuador	2006	2010	4	658	6,483.6
El Salvador	2006	2010	4	693	10,903.8
Georgia	2008	2013	5	373	3,307.0
Ghana	2007	2013	6	494	6,389.7
Guatemala	2006	2010	4	522	14,602.4
Honduras	2006	2010	4	436	7,874.2
Hungary	2009	2013	4	291	17,219.1
Kenya	2007	2013	6	657	6,500.8
Kosovo	2009	2013	4	270	1,448.3
Kyrgyz	2009	2013	4	235	1,034.9
Lao, PDR	2009	2012	3	360	2,203.3
Latvia	2009	2013	4	271	12,727.1
Lithuania	2009	2013	4	276	16,375.1
Macedonia	2009	2013	4	366	5,069.1
Mexico	2006	2010	4	1,480	83,975.7
Moldova	2009	2013	4	363	6,449.2
Mongolia	2009	2013	4	362	2,583.2
Montenegro	2009	2013	4	116	1,169.9
Nepal	2009	2013	4	368	12,091.4
Nicaragua	2006	2010	4	478	3,346.4
Panama	2006	2010	4	604	3,668.8
Paraguay	2006	2010	4	613	1,318.5
Peru	2006	2010	4	632	6,152.0
Poland	2009	2013	4	455	71,431.7
Romania	2009	2013	4	541	61,381.3
Rwanda	2006	2011	5	212	598.4
Serbia	2009	2013	4	388	12,975.0
Slovak	2009	2013	4	275	25,625.2
Slovenia	2009	2013	4	276	6,743.6
Tanzania	2006	2013	7	419	7,299.7
Uganda	2006	2013	7	563	4,007.9
Ukraine	2008	2013	5	851	51,162.4
Uruguay	2006	2010	4	621	5,865.4
Uzbekistan	2008	2013	5	366	18,415.7
Yemen	2010	2013	3	477	6,267.8
Zambia	2007	2013	6	484	3,336.2
				22,824	683,950.0

Reference

- Aldrich, H. E., & Auster, E. (1986). "Even dwarfs started small: Liabilities of size and age and their strategic implications", *Research in Organizational Behavior*, 8:165–198.
- Agarwal, R., and Gort, M. (2002) "Firm and Product Life Cycles and Firm Survival", *American Economic Review*, 92(2): 184-190.
- Austin, J. and D. Rosenbaum (1990) "The Determinants of Entry and Exit Rates into U.S. Manufacturing Industries." *Review of Industrial Organization* 5 (2):211-223.
- Ayyagari, M., A. Demircuc-Kunt, and V. Maksimovic (2013) "Size and Age of Establishments: Evidence from Developing Countries". World Bank Policy Research Working Paper, No. 6718.
- Baldwin, J. and Yan, B. (2011). "The death of Canadian manufacturing plants: Heterogeneous responses to changes in tariffs and real exchange rates", *Review of World Economics*, 147 (1):131-167
- Bernard, A., Eaton, J., Jensen B., and Kortum, S. (2002) "Plants and Productivity in International Trade." *American Economic Review* 93(4):1268-1290.
- Bernard, A. and Sjöholm, F. (2003). "Foreign Owners and Plant Survival". *NBER Working Papers* 10039.
- Bartelsman, E., Haltiwanger, J., and Scarpetta, S. (2004) "Microeconomic Evidence of Creative Destruction in Industrial and Developing Countries.", World Bank Policy Research Working Paper, 3464.
- Bloom, N., Sadun, R., and Van Reenen, J. (2012) "Management as a Technology?", mimeo, <http://web.stanford.edu/~nbloom/MAT.pdf>
- Box, M. (2008). "The Death of firms: Exploring the effects of environment and birth cohort on firm survival in Sweden", *Small Business Economics*, 31:379–393
- Cable, J. and Scwalbach, J. (1991). "International Comparisons of Entry and Exit". *Entry and Market Contestability: An International Comparison*. P.A. Geroski and J. Schwallbach (eds.). Oxford, U.K. and Cambridge, MA. Blackwell Publishing.
- Charness, G., & Gneezy, U. (2012). "Strong Evidence for Gender Differences in Risk Taking." *Journal of Economic Behavior & Organization*, 83(1):50-58.
- Cirmizi, E., L. Klapper, and M. Uttamchandani (2010) "The Challenges of Bankruptcy Reform", World Bank Policy Research Working Paper, 5448.
- Couwenberg, O. (2001). "Survival Rates in Bankruptcy Systems: Overlooking the Evidence". *European Journal of Law and Economics*. 12(3): 253-73.

- Croson, R. and Gneezy, U. (2009) “Gender Differences in Preferences,” *Journal of Economic Literature*, 47 (2): 448-474.
- Dewaelheyns, N. and Van Hulle, C. (2008). *Small Business Economics*. 31(4): 409-424.
- Disney, R., Haskel, J., & Heden, Y. (2003). “Entry, Exit and Establishment Survival in UK Manufacturing”, *Journal of Industrial Economics*, 51(1):91-112.
- Dunne, T., Roberts, M. and Samuelson, L. (1989). *Quarterly Journal of Economics*. 104(4): 671-698.
- Ericson, R. and Pakes, J. (1995). “Markov-Perfect Industry Dynamics: A Framework for Empirical Work”, *The Review of Economic Studies*, 62(1): 53-82.
- Eslava, M. and Haltiwanger, J. (2014). “Young Businesses, Entrepreneurship, and the Dynamics of Employment and Output in Colombia’s Manufacturing Industry”, **mimeo**, http://www.banrep.gov.co/sites/default/files/eventos/archivos/sem_11_cali.pdf
- Fackler, D., Schnabel, C. and Wagner, J. (2013) “Establishment exits in Germany: The role of size and age”, *Small Business Economics* 41:683–700
- Fariñas, J. and S. Ruano. (2005). “Firm Productivity, Heterogeneity, Sunk Costs, and Market Selection”. *International Journal of Industrial Organization*, 23:505-534.
- Foster, L., Haltiwanger, J. and Krizan, C. J. (2001) Aggregate Productivity Growth Lessons from Microeconomic Evidence, in New Developments in Productivity Analysis (2001), (editors) Charles R. Hulten, Edwin R. Dean and Michael J. Harper, (p. 303 - 372) University of Chicago Press
- Foster, Lucia, John Haltiwanger, and Chad Syverson. 2008. “Reallocation, Firm Turnover, and Efficiency: Selection on Productivity or Profitability?” *American Economic Review*, 98(1): 394-425.
- Faccio, M., Marchica, M.T. and Mura, R., (2014). “CEO Gender and Corporate Risk-Taking”, <http://ssrn.com/abstract=2021136>
- Frazer, G. (2005) “Which Firms Die? A Look at Manufacturing Firm Exit in Ghana” *Economic Development and Cultural Change*, 53 (3):585-617.
- Gelübcke, J., and Wagner, J (2012). “Foreign ownership and firm survival: First evidence for enterprises in Germany”, *Economie Internationale*, 132:117-139.
- Haltiwanger, J. (2012) Job Creation and Firm Dynamics in the U.S., in NBER Book Series Innovation Policy and the Economy, (editors) Josh Lerner and Scott Stern, (p. 17-38) University of Chicago Press
- Hallward-Driemeier, M. and Rijkers, B. (2013) “Do Crises Catalyze Creative Destruction? Firm-Level Evidence from Indonesia”, *The Review of Economics and Statistics*, 95(5):1788-1810.

- Harhoff, D., K. Stahl, and M. Woywode (1998) “Legal Form, Growth and Exit of West German Firms”, *Journal of Industrial Economics*, 46:453–488.
- Hopenhayn, H. (1992). “Entry, Exit, and Firm Dynamics in Long Run Equilibrium” *Econometrica*, 60(5):1127-1150.
- Jovanovic, Boyan (1982) “Selection and the Evolution of Industry” *Econometrica*, 50(3): 649-70.
- King, R. and Levine, R. (1993) “Finance, Entrepreneurship, and Growth: Theory and Evidence”, *Journal of Monetary Economics*, 32(3): 513-542.
- Keil, T. and Pe'era, A., (2012). “Are all startups affected similarly by clusters? Agglomeration, competition, firm heterogeneity, and survival”, *Journal of Business Venturing*, 28 (3):354–372
- Klapper, L., Laeven, L., and Rajan, R. (2006). “Entry Regulation as a Barrier to Entrepreneurship”. *Journal of Financial Economics*. 82(3): 591-629.d
- Klapper, L., and Love, I., (2010a) The Impact of the Financial Crisis on New Firm Registration, Policy Research Working Paper 5444.
- Klapper, L., and Love, I., (2010b) The Impact of Business Environment Reforms on New Firm Registration, Policy Research Working Paper 5493.
- Klapper, L., Love, I., and Randall, D. (2014) New Firm Registration and the Business Cycle, Policy Research Working Paper 6775
- Klapper, L. and Richmond, C. (2011) “Patterns of Business Creation, Survival and Growth Evidence from Africa”, Policy Research Working Paper 5828
- Levine, R. (2005) “Finance and Growth: Theory and Evidence.”, in in Handbook of Economic Growth, (editors) Philippe Aghion and Steven Durlauf, (p. 865 - 934) Elsevier Science, The Netherlands.
- Lucia Foster, John Haltiwanger, And C. J. Krizan (2006) “Market Selection, Reallocation, And Restructuring In The U.S. Retail Trade Sector In The 1990s”, *The Review of Economics and Statistics*, 88(4):748-758.
- Melitz, M (2003). “The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity”, *Econometrica*, 71(6):1695-1725.
- McPherson, M. A. (1995). “The hazard of small firms in Southern Africa”, *Journal of Development Studies*, 32(1):31–54.
- Olley, S. and Pakes, A. (1996) “The Dynamics of Productivity in the Telecommunications Equipment Industry”, *Econometrica*, 64 (6):1263-1297.

- Pakes, A., & Ericson, R. (1998). Empirical implications of alternative models of firm dynamics. *Journal of Economic Theory*, 79(1):1-46.
- Pavcnik, N. (2002) "Trade Liberalization, Exit, And Productivity Improvements: Evidence From Chilean Plants", *Review of Economic Studies* 69:245-276.
- Perez, S. E., Llopis, A. S. and Llopis, J. A (2004) "The Determinants of Survival of Spanish Manufacturing Firms", *Review of Industrial Organization*, 25: 251–273.
- Rosenbaum, D. and F. Lamort (1992) "Entry, Barriers, Exit, and Sunk Costs: An Analysis". *Applied Economics*, 24 (3):297-304.
- Richard Disney, Jonathan Haskel And Ylva Heden (2003) "Restructuring And Productivity Growth In UK Manufacturing", *The Economic Journal*, 113:666–694.
- Shiferaw, A. (2009) "Survival of Private Sector Manufacturing Establishments in Africa: The Role of Productivity and Ownership", *World Development* 37(3):572–584.
- Soderbom, M., Teal, F., & Harding, A. (2006). "The determinants of survival among African manufacturing firms", *Economic Development and Cultural Change*, 54(3):533–555.
- Thorburn, K. (2000). "Costs of Debt Recovery and Firm Survival". *Journal of Financial Economics*. 58(3): 337-68.