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A CROSS-COUNTRY AND INDUSTRY ANALYSIS

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ABSTRACT

This paper examines the impact of international trade on firm entry and exit in Europe. The results point to strong displacement exit and less creative replacement entry in industries characterized by increasing import competition Moreover, the evidence suggests strong selection and higher entry barriers in industries characterized by higher openness through the export channel. The negative effects of trade openness lose importance if the increasing trade exposure concerns intra-industry trade, mainly coupled with international sourcing within the industry.

Keywords: Globalization, Exit, Entry

1. EXECUTIVE SUMMARY

Entrepreneurship is proved to be beneficial for job creation and economic growth. In the last thirty years Western countries have witnessed a shift from the "managed" to the "entrepreneurial" economy, which is characterised by a central role of entrepreneurs in innovation activities and wealth creation (Audretsch and Thurik, 2001). Fostering entrepreneurship has thus become a priority for policy makers. At the same time, globalization has been changing the competitive environment in which firms operate. Increasing economic openness implies higher competitive pressure for companies, but also more business opportunities on the international markets. In this context, an effective entrepreneurship policy needs to take the global dimension of business into account. And yet, very little is known about the impact of globalization on entrepreneurship. In this paper we start filling the gap by studying the relation between international trade and firm entry and exit dynamics. In particular we explore, at the empirical level, the effects of changes in various measures of trade openness on sectoral entry and exit rates. We do this through panel econometric regressions, focusing on eight European countries: Belgium, Denmark, Finland, Italy, Netherlands, Spain, Sweden and United Kingdom. The analysis is carried on twelve manufacturing sectors, for the time span 1997-2003. Industry-level data from Eurostat are employed in a novel empirical framework, in which several trade-related explanatory variables are included. At the same time, we control for other factors which previous literature has identified as important determinants of industry dynamics.

The main results can be summarized as follows. First, we find that an increase in openness to trade raises exit rates at the industry level, through the import competition channel. International competitive pressure is thus found to be responsible for the displacement of European manufacturing firms. Second, concerning entry, an increasing level of openness to trade is found to lower firm birth rates, trough both drivers of import competition and export intensity. Import pressure indirectly affects the creation of new business ventures through the channel of "replacement entry", i.e. the component of entry which is directly associated to earlier exit dynamics. In fact, we find that less replacement entry takes place with respect to firm exit which is driven by import displacement.

This result has important implications. Indeed, many empirical studies of industry dynamics have shown the presence of a positive correlation between entry flows and previous exit (Dunne et al., 1988; Siegfried and Evans, 1994; Mata and Portugal, 1994; Caves, 1998; De Backer and Sleuwaegen, 2003). In a recent article, Pe'er and Vertinsky (forthcoming) show that such a process of creative replacement entry is beneficial for aggregate productivity growth at the local level. In fact, new business ventures replace exiting incumbents and re-employ their released resources in more productive ways, for instance by adopting new technologies. Pe'er and Vertinsky do not assess to what extent different drivers of firm exit might influence this process. However, our results warn that replacement entry dynamics might be less relevant when exit is caused by import penetration. In fact, import displaced firms are more likely to be involved in activities which are at odds with a country's comparative advantages, and thus not appealing for potential new entrepreneurs. Increasing levels of incumbents' export intensity have instead a direct negative impact on firm birth rates. This finding suggests that, as the market selects successful exporting firms, barriers to entry increase. The minimum efficiency and capital commitment levels which are required to enter the market are raised, thus resulting in lower entry. Finally, other things equal, lower exit and higher entry rates are found to be associated with increasing intra-industry trade, which captures both growth in international sourcing of intermediates and product differentiation dynamics. When explicitly controlling for international sourcing of intermediate goods, our results point to off-shoring as an effective strategy in reacting to foreign competition. Indeed, if trade complementarities in a sector are rising as a result of increasing sourcing of intermediates from abroad, fewer firms exit and relatively more new business ventures are created in the industry.

Overall, our results deepen the empirical evidence on trade pressure and exit in the first place. Secondly, and most importantly, they shed some first interesting light on entry in globalizing industries. The whole analysis conveys important implications for entrepreneurship policy, which are developed in the last section of the paper.

2. INTRODUCTION

Trade liberalization is proved to be ultimately welfare enhancing. However, a costly adjustment process needs to be undergone in order for gains from trade to be realized. Resources in the economy need to be reallocated, across and within sectors, in such a way that efficiency is enhanced. Firms are key players of the latter process, and as such they are being paid increasing attention in the international trade literature, both at the empirical and theoretical level, as reviewed by Bernard et al. (2007) and Tybout (2003).

Following the latest research developments, we can think about two different margins of industry adjustment to trade, which can be called "intensive" and "extensive". The intensive margin works through firms' growth and behavioural change. For instance, Bernard et al. (2006b) show that the growth differential in favour of capital intensive firms rises with the level of import competition in US manufacturing. Moreover, US firms are found to change systematically their product mix in response to import pressure, shifting to more capital and skill intensive activities. International outsourcing is also found to be a strategic reaction sheltering manufacturing firms from import competition in Belgium (Coucke and Sleuwaegen, forthcoming). All this evidence points to a trade related reallocation of resources among surviving firms towards higher value added activities, consistent with the comparative advantages of developed countries. Firm turnover is the complementary "extensive" margin of industry adjustment, and constitutes the focus of our paper. Up to date, empirical studies have primarily focused on firm exit, and increasing trade exposure has been found to lower the likelihood of firm survival (Bernard et al., 2006a-2006b; Coucke and Sleuwaegen, forthcoming). Consistent with the theoretical market selection predictions (Melitz, 2003; Melitz and Ottaviano, 2005; Bernard et al., 2007), heterogeneous firms seem to be affected differently by globalization pressure, with less productive and labour intensive companies being more at risk of failure. In spite of this interest on exit, no comparable attention has been paid to its mirror phenomenon: firm entry. To the best of our knowledge, with the partial exception of De Backer and Sleuwaegen (2003), no studies have looked insofar at the impact of trade exposure on the creation of new business ventures. By focusing on both entry and exit of firms in a novel conceptual framework, our paper fills this gap in the literature.

Moreover, we add to the body of existing evidence in at least two other ways. First, thanks to the availability of comparable industry level data, entry and exit patterns are studied across countries. Second, for the first time we separately assess the effects of trade integration on the population of small firms (with less than twenty employees).

The remaining of the paper is organized as follows. In section 3 we develop our conceptual framework and posit the research hypotheses. In section 4 data and analytical model are presented. Results are analysed in section 5, while section 6 concludes.

3. CONCEPTUAL FRAMEWORK AND HYPOTHESES

Recently developed models of international trade with heterogeneous firms predict that trade liberalization increases the competitive pressure on companies, thus resulting in a market selection process (Melitz, 2003; Bernard et al., 2003; Melitz and Ottaviano, 2005). When openness to trade increases, the minimum productivity level to stay in business is bid up. As a result, the least productive firms are forced to exit, while the most efficient ones benefit from the liberalization by entering the export markets and expanding. This prediction has been confirmed by firm-level empirical work on the US manufacturing sector by Bernard et al. (2006a, 2007). In theory, the impact of trade on exit could be driven by both import competition, through lower mark-ups (Melitz and Ottaviano, 2005), and export intensity (Melitz, 2003). In the latter case, less efficient firms are crowded out on the factor markets by the more productive companies selling abroad. Previous empirical studies have focused on import competition pressure, which is found to result in lower probability of survival at the firm level and, consistently, in higher exit rates at the industry level (Bernard et al., 2006b; Coucke and Sleuwaegen, forthcoming; De Backer and Sleuwaegen, 2003). However, the export intensity effects should also be tested for. We therefore posit:

H1: An increase in openness to trade results in higher exit rates at the sector level. Both rising import competition and export intensity drive the effect.

As previously anticipated, much less attention has been paid in the literature to firm entry in globalizing industries. At the theoretical level, a model by Grossman (1984) predicts lower entrepreneurial rates in an open economy relatively to the autarky case, in the absence of efficient risk sharing markets. The latter prediction has been empirically confirmed by De Backer and Sleuwaegen (2003), working on Belgian manufacturing industries. In both articles the focus is on the import competition channel, and there is no control for the export dynamics in the empirical estimation. Instead, we think that it is crucial to look also at the export intensity side of trade integration. In fact, when trade exposure increases, the whole industry structure facing a new business venture changes. The market selects the most productive incumbents, which emerge as successful exporters and grow by capturing new market opportunities abroad. The new relevant market for a potential entrepreneur thus becomes more competitive and risky. This implies higher barriers to entry and is intuitively likely to result in lower creation of new firms. Hence:

H2: An increase in openness to trade results in lower entry rates at the sector level. Both rising import competition and export intensity drive the effect.

Several empirical studies of industry dynamics have shown that firm entry tends to be positively correlated with previous exit (Dunne et al., 1988; Siegfried and Evans, 1994; Mata and Portugal, 1994; Caves, 1998; De Backer and Sleuwaegen, 2003). A theoretical interpretation is provided by the carrying capacity models, with the concept of replacement entry (Geroski, 1995; Carree and Thurik, 1999). The simple underlying idea is that, as incumbent firms exit, room for new entrepreneurs becomes available in the market. In a recent paper, Pe'er and Vertinsky (forthcoming) show how such a process of creative replacement entry is associated to productivity growth at the local level. Indeed, they find that exit of incumbent firms (especially older ones) results in higher subsequent entry and aggregate efficiency gains, as new entrants are on average more productive than exiting firms. These findings suggest that new business ventures may take advantage of resources which are released by previous exit and re-employ them in more productive ways, for instance by adopting new technologies. Pe'er and Vertinsky do not analyze how different drivers of exit affect these dynamics.

However, as manufacturing firms are displaced by increasing import competition, we might expect the process of replacement entry to be less relevant. In fact, import penetration primarily displaces firms involved in activities which are at odds with a country's comparative advantages, and thus not appealing for new potential entrepreneurs. Therefore we posit:

H3: Relatively less replacement entry takes place with respect to exit which is due to import competition displacement.

We have based our hypotheses on the traditional concepts of import competition and export intensity. Basically this means referring to the evolution of trade volumes relatively to domestic production over time. However, there is reason to believe that changes in the composition of trade also matter in explaining industry dynamics. Going back to our previous description of the intensive margin of sectoral adjustment to trade, Bernard et al. (2006b) have shown that US firms react to import competition by shifting to more capital and skill-intensive products, which are less exposed to the latter competitive pressure. At the same time, labour-intensive activities are increasingly off-shored to low-wage countries. A growing number of firms in wealthier economies are actively facing the global competitive pressure by sourcing intermediates abroad (OECD 2006). This cross-country fragmentation of production networks often involves two-way outward processing trade flows. All the latter adjustment dynamics jointly result in increasing trade complementarities within broadly defined sectors, which can be captured by a growth in the standard Grubel-Lloyd index of intra-industry trade (see section 3). Indeed, Coucke and Sleuwaegen (forthcoming) show that firms in industries with low levels of intra-industry trade (IIT) are more sensitive to import competition in terms of lower probability of survival. We can also expect to observe relatively higher entry rates in those sectors in which IIT is increasing. In fact, potential entrepreneurs would rather choose to enter those industries which are getting more fit with respect to the global competitive scenario, in terms of product differentiation and international sourcing dynamics. Therefore we posit:

H4: Ceteris paribus, lower exit and higher entry rates are associated with positive variations in Intra Industry Trade.

4. DATA AND EMPIRICAL MODEL

4.1 Data Description

Our analysis is based on the new "Business Demography Statistics" database by Eurostat. We employ sectoral entry and exit rates for eight European countries: Belgium, Denmark, Finland, Italy, Netherlands, Spain, Sweden and United Kingdom[1]. We focus on the manufacturing sector, for the time-span: 1997-2003. Data are provided at the Eurostat NACE (Rev. 1.1) "sub-section" level of industry aggregation[2]. Sub-sections are identified by two-character alphabetical codes (from DA to DN) and correspond to two-digit sectors or aggregations of them (see Table 1).

Insert Table 1 About Here

Two industries have been excluded from the analysis: "manufacturing of coke, refined petroleum products and nuclear fuels" (DF) and "manufacturing n.e.c." (DN). In the former case, the choice is due to the peculiar nature of the sector, whose industry dynamics are more likely to be related to legal changes and natural factors rather than trade. "Manufacturing n.e.c." is instead a residual category for relatively heterogeneous activities (from the manufacturing of furniture to recycling), which would evidently raise problems in analysing the relation between sector-level trade openness and firm dynamics.

Entry (exit) rates are defined as the ratio of the number of enterprise births (deaths) in the reference year over the number of enterprises active in the same period, for each industry-country pair. Data are comparable across countries and are constructed to reflect "true" entry and exit of firms. Indeed, in Eurostat words, enterprise births (deaths) refer only to the real creation (dissolution) of companies. In practice this is obtained by processing the full national business registers data in order to identify and exclude those entries and exits which are just due to mergers, take-overs or break-ups of firms.

[1] The sample selection is driven by data availability reasons. Indeed, not all the European countries participate in the demography data collection. Portugal was excluded due to lack of data for other variables which will be used in the analysis.

[2] NACE (Rev. 1.1) is the European classification of economic activities corresponding to ISIC (Rev. 3.1).

Changes of activities at the firm level also do not result in exit (entry) from (in) a given sector. Moreover, a company is excluded from the count of deaths in a given period if it gets reactivated within two years. Specularly, the eventual reactivation is not counted as a birth.

This kind of data processing also explains the time-lag in the data release[3]. Finally, as previously anticipated, separate sectoral figures can be retrieved for the category of small firms (with less than twenty employees).

Table 2 provides some descriptive statistics referring to country-specific average entry and exit rates (across sectors and time).

Insert Table 2 About Here

Both general and small firms' figures are presented. As we can see from the bottom row, overall entry and exit rates are on average 5.8% and 6.3% respectively. Intuitively, small firms' figures are higher than the ones referring to the whole population. UK and Spain are the countries displaying the highest level of firm churning. Spain is also the only country for which birth rates are on average higher than the exit ones. In Table 3 we report the yearly average figures (across countries and sectors).

Insert Table 3 About Here

Two trends seem to emerge: exit rates are on average increasing over time while entry rates are significantly declining. For instance, the overall mean birth rate drops from 6.9% in 1998 to 5.4% in 2003. Following our hypotheses, in the empirical analysis we will investigate the relation between these firm dynamics and the evolution in trade exposure. It is therefore important at this stage to present the foreign trade data and the indicators that will be employed.

Sectoral import and export flows are retrieved from the Eurostat COMEXT foreign trade database, from 1995 to 2003.

[3] Further details can be found on the Eurostat metadata documents: http://epp.eurostat.ec.europa.eu

We adopt the following measure of general openness to trade: the sum of industry imports and exports over the sum of domestic production plus imports[4] (Klein, Schuh and Triest, 2003). This index can be further decomposed into two components: import competition and export intensity. The former is defined as in Davis et al. (1996): sectoral imports over the sum of domestic production plus imports.

Specularly, the latter is computed as the ratio of industry exports over the same denominator. Graph 1 shows the evolution of the general trade openness index from 1995 to 2003, at the country level, for the whole manufacturing sector. The level of trade exposure is increasing everywhere but in Finland. The average growth is around 8 percentage points, with Belgium witnessing the highest boost: 19 perc. points. Graphs 2 and 3 reveal that the increase in general openness is driven almost equally by its two components: import competition and export intensity. Indeed, they grow on average by 4.4 and 3.3 percentage points respectively.

These descriptive statistics confirm the view that a trade integration process is going on, and this is characterized by both increasing import competition and higher export intensity at the industry level.

Finally, in order to test for our *H3* we will employ the Grubel-Lloyd (1975) index of intra-industry trade, which is computed as follows (Coucke and Sleuwaegen, forthcoming; Marvel and Ray, 1987):

$$IITijt = 2*\min (Mijt, Xijt)/(Mijt + Xijt)$$

where M equals total imports and X stands for total exports of sector *i*, in country *j*, at time *t*.

The index ranges between zero (no intra-industry trade) and one (perfect intra-industry trade), and captures the level of product heterogeneity and trade complementarities between each sector-country pair and the trading partners. We interpret an increase in intra-industry trade as an adjustment to trade liberalization. In fact, the index is likely to grow following firms' strategic reactions to global integration, in terms of product differentiation and international outsourcing. For instance, it has been shown that companies adjust to increasing import pressure by

[4] Domestic production figures are available in the Eurostat "Structural Business Statistics" database.

changing their product mix and developing market segments facing lower foreign competition (Bernard et al., 2006b). Global sourcing of intermediate inputs and outward processing trade are also becoming increasingly relevant (Coucke and Sleuwaegen, forthcoming; OECD 2006).

When evaluated at our broad (NACE "sub-section") level of industry aggregation, the latter dynamics are expected to result in higher correlation of import and export flows, thus leading to an increase in the Grubel-Lloyd index.

4.2 The empirical model

In what follows we present the baseline econometric model which will be estimated in order to test for our hypotheses:

$$\text{Exit (Entry)}_{ijt} = \beta 0 + \beta 1 \, \text{lag}(\Delta \, \text{TradeExposure}_{ij}) + \beta 2 \, \Delta \, \text{IIT}_{ijt} + \beta 3 \, Z_{ij(t-1)} + \beta i + \beta j + \beta t + \varepsilon_{ijt}$$

where *i* indicates the industry, *j* stands for the country and *t* for the year.

Depending on the considered hypothesis, the dependent variable can be either the industry-level exit rate or the entry rate (both defined as explained in subsection 4.1). *Δ TradeExposure* represents the percentage point variation in the trade exposure index whose effects are tested for. We will always start with the overall trade openness index, and then separately consider its two components: import competition and export intensity (see subsection 4.1). Intuitively, and consistent with previous studies (Bernard et al., 2006b; Coucke and Sleuwaegen, forthcoming; De Backer and Sleuwaegen 2003), we allow for a lagged adjustment to the growth in trade exposure. Without having a prior on the exact lag structure, we will begin the analysis by including both the first and second lagged variations in overall trade openness, thus accounting for both changes between (t-1) and (t-2), and between (t-2) and (t-3).

Δ IIT represents the percentage point change in the Grubel and Lloyd (1975) index of intra-industry trade, as defined in the previous subsection.

A positive variation is interpreted as an industry adjustment to trade integration; therefore the contemporaneous IIT change (between (t) and (t-1)) is included in the exit rate regressions in order to test for the first part of *H3*: i.e. the presence of a negative correlation between the extent of industry adjustment and the death rate. Instead, the second part of *H3* is tested for by including the lag one variation of IIT in the Entry regressions.

(β_i , β_j , β_t) stand for industry, country and year fixed effects. They are included to control for unobserved heterogeneity and cyclical effects. Finally, *Z* represents a vector of industry/country specific lagged control variables, whose inclusion is suggested by theory and empirical evidence on industry dynamics. They are presented in the remaining of this section.

Many papers have shown the presence of a positive correlation between entry and exit flows in subsequent periods (Dunne et al., 1988; Siegfried and Evans, 1994; Mata and Portugal, 1994; Caves, 1998; De Backer and Sleuwaegen, 2003). Higher entry in a year is found to raise exit in the following one, and vice versa. A theoretical explanation is provided by the carrying capacity models, with the concepts of displacement and replacement entry (Geroski, 1995; Carree and Thurik, 1999). Intuitively, firm entries displace incumbents, while room and resources for new business ventures are released by previous exit (Pe'er and Vertinsky, forthcoming). Consistent with this, we control for lagged entry and exit rates in our regressions.

Total factor productivity seems to be an important determinant of survival at the firm level; in fact, more productive firms are found to be less likely to exit (Bernard et al., 2006a-2006b; Coucke and Sleuwaegen, forthcoming). As we have seen, this is consistent with the theoretical predictions on survival emerging from the new models of international trade with heterogeneous firms (Melitz, 2003; Melitz and Ottaviano, 2005; Bernard et al., 2003). Throughout our analysis, we control for total factor productivity (%) growth at the industry level (*TFP Growth*). However, given the sector level focus of our study, the expected effect on the exit rate is not obvious: it will depend on the distribution of firm-level changes in TFP. For instance, if the productivity growth is not homogeneous across companies, the effects on firm level survival could cancel out at the industry level. On the contrary, we might expect sectoral productivity growth to lower future entry rates. Indeed, an increase in productivity at the industry level results in a more competitive environment for a new entrepreneurial venture.

The minimum efficiency level which is required to enter the market is likely to increase, thus resulting in higher barriers to entry. Data on industry level total factor productivity are sourced from the EU KLEMS database (March 2007 version). The latter db is the outcome of a project financed by the European Commission for the analysis of productivity and growth.

It has been produced by a consortium of 15 organizations across the EU, with support from Eurostat, OECD, the Groningen Growth and Development Centre and various National Statistical Institutes[5]. Sectoral productivity is estimated through a growth accounting exercise, by taking into account various categories of capital, labor, energy, material and service inputs[6].

We also incorporate a second control for the evolution of barriers to entry: the (%) growth in the physical capital services per hour worked (*K/L Growth*), also retrieved from the EU KLEMS database[7]. The inclusion of this variable is motivated by capital intensity being identified as an important factor affecting entry and exit decisions (Geroski, 1995; De Backer and Sleuwaegen, 2003). As a last control, we include the logarithm of the net investment in tangible assets over turnover at the sector level (*Investment*). This variable is computed from Eurostat data and constitutes a proxy for the extent of restructuring, capacity building and investment opportunities in the industry. As such, it is expected to have a positive impact on both exit and entry, since restructuring waves are normally characterized by higher firm churning (Geroski, 1995).

The model is estimated through Least Squares Dummy Variables regressions, with heteroskedasticity robust standard errors. Results are presented in the following section, first for exit and then for entry. A final discussion will follow.

[5] More details are available on the EU KLEMS website: http://www.euklems.net/index.html
[6] The methodology and variables are described in "EU KLEMS growth and productivity accounts (Version 1.0). Part I Methodology".
[7] See the previous footnote for a methodological reference.

5. RESULTS

5.1 Trade integration and Exit

Table 4 reports the outcome of the exit regressions estimation. Results in the first column refer to the basic model in which no trade-related regressors are included. The dependent variable is the general exit rate at the sector-country level.

Insert Table 4 About Here

As expected, exit is positively correlated with previous entry. A 1 percentage point increase in the lagged entry rate results in higher current exit by almost 0.25 perc. points. Consistent with previous studies, a higher restructuring intensity seems to increase the exit rate. Finally, both changes in capital intensity and total factor productivity are not significant at conventional levels. The result on productivity is not surprising given the industry level scope of the analysis, as already explained in the previous section.

As a second step, we start exploring the impact of trade integration on exit. This is done by including in the model the lagged variation of the sectoral trade openness index. Consistent with what previously said about the lag structure of adjustment, both changes in the index at lag 1 and lag 2 are included. Results are reported in column 2. As we can see, the variation in trade openness between (t-1) and (t-2) has a positive and significant impact on the exit rate, while the second lag is not significant. Exit thus seems to be immediately responding to an increase in trade integration. In particular, a 10 percentage point growth in the openness index results in a 0.36 perc. point increase in the exit rate in the following period. This result provides evidence in favor of the first part of *H1*, in which a positive impact of openness to trade on firm exit is conjectured.

In column 3 we go deeper and separately investigate the role of import competition and export intensity, together with variations in intra-industry trade. From the results, the just discussed openness effect on exit seems to be basically driven by import penetration.

Indeed, a 10 percentage point growth in import competition results in a 0.6 perc. point increase in the death rate in the following period, which represents about 10% of the average exit rate. On the contrary, export intensity is not found to be significant, which goes against the second part of hypothesis 1.

As expected, exit rates are negatively correlated with variations in the IIT index: *ceteris paribus*, relatively less firms exit from a sector if an adjustment is going on in terms of rising trade complementarities. This supports hypothesis 4, as far as exit is concerned. As already explained, at our level of sectoral aggregation, intra-industry trade might grow because of two factors: product differentiation and increasing international sourcing of intermediate inputs. Both channels are captured by the Grubel-Lloyd index and cannot be directly disentangled. However, we can obtain some more insights on this result by explicitly controlling for the outsourcing dynamics. In column 4 we report the results of this refinement. The variation in intra-industry trade is interacted with two dummy variables, pointing at two groups of sector-country pairs. Group "high" includes those pairs for which the level of global sourcing is increasing between 1995 and 2000, while group "low" incorporates the remaining ones. This methodological choice is due to data availability on international sourcing, which is measured as the share of imported intermediates out of the total value of inputs that each sector is sourcing from itself (Feenstra and Hanson, 1996). In fact, this ratio is computed starting from Eurostat Input-Output data, which are only available for the years 1995 and 2000. Thus, yearly variations cannot be computed. However, the changes over five years are still suggestive of the sector (and country) specific trends in terms of off-shoring, whose role is worth exploring. When looking at the results, only the coefficient for the "high" interaction is significantly different from zero. This suggests that the negative correlation between IIT variations and firm failure is driven by sectors in which the level of global sourcing is increasing over time.

The hypotheses, so far, have been tested at the industry level. However, our data allow us to somehow explore the role of firm size in this context. In particular, in the last column we have re-estimated the baseline model (of column 3) by employing demography data which refer only to the population of small firms (with less than 20 employees). We can thus test whether small companies display a different behaviour with respect to the rest of the population. In our view, this is an important issue which has not been paid enough attention in previous studies.

Indeed, both Bernard et al. (2006a, 2006b) and Coucke and Sleuwaegen (forthcoming) control for firm size in their empirical analysis, but this variable is not interacted with the crucial trade-related ones. The outcome suggests that increasing import penetration affects small firms to the same extent as the rest of the population. Indeed, the import competition coefficients in column 3 and 5 are not significantly different from each other.

5.2 Trade integration and Entry

Column 1 in Table 5 shows the results from the estimation of the basic entry model, where no trade-related regressors are included.

Insert Table 5 About Here

The dependent variable is the general entry rate at the industry-country level. Consistent with earlier evidence, birth rates are positively correlated with previous exit. A 1 percentage point increase in the lagged exit rate results in higher current entry by roughly 0.18 perc. points. As expected, entry is also positively associated with sectoral investments, while birth rates are significantly lowered by increasing capital intensity. The coefficient on TFP growth has the expected sign, but it is not significant at conventional levels.

Proceeding in the same way as for exit regressions, in column 2 we add to the basic specification both lags of the change in overall trade openness. We find that entry is reduced by an increase in trade exposure with a lagged adjustment. In particular, a 10 percentage point increase in trade openness between (t-2) and (t-3) results in lower entry rates at time (t) by 0.44 perc. points, which represent about 8% of the average entry rate. This result is consistent with what conjectured in *H2*. The difference in timing between entry and exit adjustment dynamics is not surprising, considering the planning process and administrative procedures which are required for a new entrepreneurial venture to start operating (Djankov et al. 2002).

In column 3, the impact of import competition and export intensity on firm entry are separately explored, together with variations in intra-industry trade. Results suggest that the openness effect is basically driven by export dynamics.

The import variable is instead not significant, although it might still indirectly affect entry through the lagged exit rate. In fact, from the exit regressions we know that an increase in import competition boosts the death rate in the subsequent period.

Thus, in the fourth column we test for hypothesis 3 by interacting *Exit Rate*$_{(t-1)}$ with Δ *Imp Comp*$_{(t-2)}$. Our results confirm what conjectured, as less replacement entry seems to take place when exit is associated to increasing import competition. Moreover, consistent with the expectations, an increase in intra-industry trade is found to enhance firm entry. In particular, a 10 percentage point increase in the Grubel-Lloyd IIT index results in higher entry rates by 0.33 perc. points. Hence, our hypothesis 4 is also supported by empirical evidence on birth rates.

In order to further deepen the analysis, we have interacted the change in intra-industry trade with the two dummies pointing at increasing ("high") versus decreasing ("low") global sourcing of intermediates, exactly as done before for the exit regressions. Results from this exercise are reported in column 5, and are qualitatively similar to the ones obtained for firm exit. In fact, only the interaction with dummy "high" is positive and statistically significant, suggesting that global sourcing dynamics are driving the impact of IIT on firm entry.

As a final step, in column 6 we have re-estimated the baseline model for small firms (with less than 20 employees). Consistent with previous results on exit, small companies do not seem to display a different pattern of response with respect to changes in export intensity. Indeed, the coefficients for *Exp Intensity*$_{(t-2)}$ in column 4 and 6 are not significantly different from each other.

6. DISCUSSION AND CONCLUSIONS

Our body of empirical evidence confirms, across-countries, that the evolution in trade exposure affects both sides of firm turnover: exit and entry. First, following an increase in openness to trade, European firms are more at risk of failure. The displacement seems to occur through higher import competition, consistent with previous results by Coucke and Sleuwaegen (forthcoming) and Bernard et al. (2006b). However, we have also explicitly tested for the export intensity channel, without finding a significant impact on sectoral failure rates.

This suggests that higher competition on the product markets (Melitz and Ottaviano, 2005) rather than displacement on the factor markets (Melitz, 2003) is driving the effect. Industry-level exit rates are negatively correlated with intra-industry trade growth.

All else equal, relatively less firms exit from sectors in which an adjustment is going on in terms of rising trade complementarities with respect to the partner countries. When explicitly controlling for global sourcing of intermediates, the latter correlation seems to be determined by off-shoring dynamics. This result is consistent with the findings by Coucke and Sleuwaegen (forthcoming) pointing to international sourcing as a strategy resulting in higher firm survival probabilities in Belgium.

Regarding firm entry, we find that an increase in trade openness results in lower birth rates (with a lagged adjustment), through both drivers of import competition and export intensity. First, import penetration has an indirect effect on birth rates through the replacement entry channel, i.e. the component of entry which is directly related to previous exit. Indeed, we find that relatively less replacement entry takes place when exit is associated to increasing import competition. Many studies have shown that firm entry is positively related with exit in earlier periods, as new business ventures may take advantage of market shares and resources which are released by exiting incumbents (Dunne et al., 1988; Siegfried and Evans, 1994; Mata and Portugal, 1994; Caves, 1998; De Backer and Sleuwaegen, 2003). Pe'er and Vertinsky (forthcoming) show that such a process of replacement entry also leads to aggregate productivity growth, as new entrants re-employ existing resources in more productive ways. Our results warn that these dynamics might be less relevant when firm exit is due to increasing import pressure. In fact, import displaced firms are more likely to be involved in activities which are at odds with a country's comparative advantages, and thus not appealing for potential new entrepreneurs. Export intensity has instead a direct negative impact on firm entry, which can be interpreted as follows: as trade exposure increases, the market selects the most efficient firms, which grow by expanding in the export markets (Melitz, 2003; Melitz and Ottaviano, 2005; Bernard et al., 2007). This dynamic is captured by an increase in the export intensity index, and intuitively results in higher barriers to entry for new business ventures. The relevant market for a potential entrepreneur becomes in fact more competitive, inducing a decline in entry rates.

Finally, relatively more firms enter those sectors in which the level of intra-industry trade is increasing. Also in this case the effect seems to be driven by international off-shoring dynamics.

Our results convey important implications on entrepreneurship policy in times of globalization. First of all, public authorities should favour firm restructuring processes.

Indeed, reorganization of production seems to be an effective strategy leading to lower exit and higher firm entry at the industry level. Restructuring may be supported through flexible labour market regulation and a general simplification of bureaucratic requirements on doing business. Secondly, following the shift in comparative advantages towards knowledge intensive activities, technological innovation has become “the” crucial factor in determining the growth potential of European countries. Consequently, investments in research and development should be enhanced, for instance through fiscal incentives and by favouring partnerships between companies, universities and public research institutes. Finally, there is evidence that globalization is associated to higher risk, tougher competitive pressure and increasing barriers to entry for potential entrepreneurs, resulting in declining entry rates in the analysed countries. In this context, an effective entrepreneurship policy should focus on helping entrepreneurs in exploiting the new opportunities which become available on the international markets. This primarily involves the provision of information and the engagement of public institutions in network building between domestic and foreign entrepreneurs. Moreover, as the entry level of capital commitment increases, improving access to finance must be a key policy goal in order for entrepreneurial energies to develop. This requires liberalization and appropriate regulation of the financial sector in the first place. In addiction, efforts should focus on the development of venture capital markets and investment funds, whose risk pooling facilitates the financing of a wider range of entrepreneurial projects.

To conclude, our findings contribute to the understanding of the relation between trade and firm exit, and provide some first insights on entry dynamics in globalizing industries. Further research efforts should explore the effects of trade integration on the characteristics of new business ventures and their survival perspectives. The role of country-specific institutions in this context should be analysed as well.

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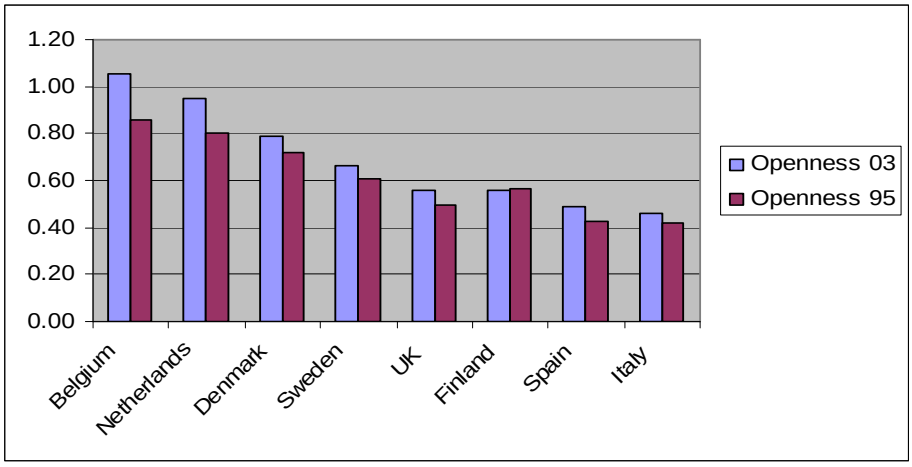
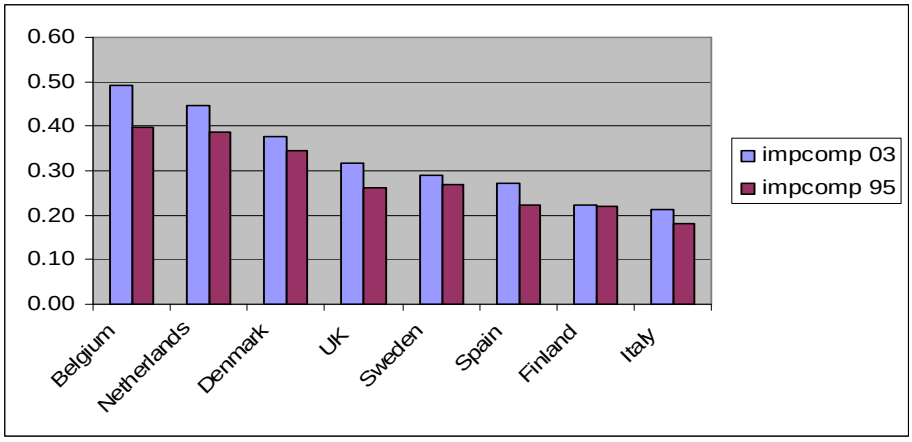
Graph 1: Variation in trade openness: 1995-2003



Graph 2: Variation in import competition: 1995-2003



Graph 3: Variation in export intensity: 1995-2003

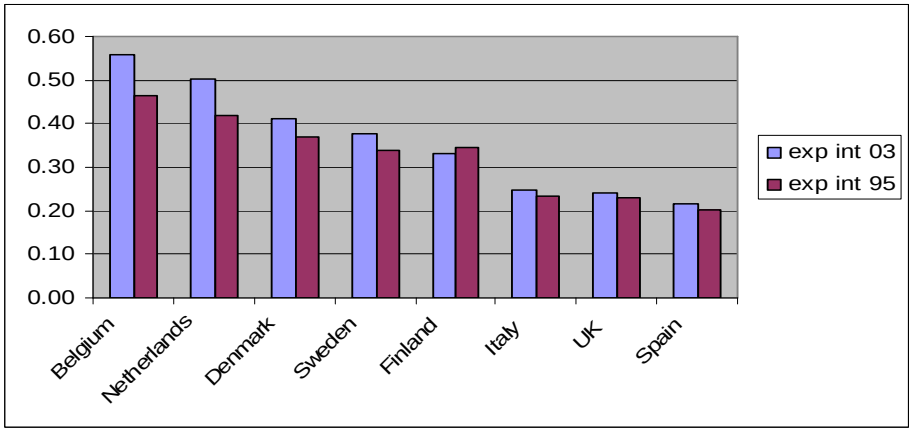


TABLE 1

Nace (revision 1.1) manufacturing sub-sections

DA	Manufacture of food products, beverages and tobacco
	15 Manufacture of food products and beverages
	16 Manufacture of tobacco products
DB	Manufacture of textiles and textile products
	17 Manufacture of textiles
	18 Manufacture of wearing apparel; dressing and dyeing of fur
DC	19 Manufacture of leather and leather products
DD	20 Manufacture of wood and wood products
DE	Manufacture of pulp, paper and paper products; publishing and printing
	21 Manufacture of pulp, paper and paper products
	22 Publishing, printing and reproduction of recorded media
DF	23 Manufacture of coke, refined petroleum products and nuclear fuel
DG	24 Manufacture of chemicals, chemical products and man-made fibres
DH	25 Manufacture of rubber and plastic products
DI	26 Manufacture of other non-metallic mineral products
DJ	Manufacture of basic metals and fabricated metal products
	27 Manufacture of basic metals
	28 Manufacture of fabricated metal products, except machinery and equipment
DK	29 Manufacture of machinery and equipment n.e.c.
DL	Manufacture of electrical and optical equipment
	30 Manufacture of office machinery and computers
	31 Manufacture of electrical machinery and apparatus n.e.c.
	32 Manufacture of radio, television and communication equipment and apparatus
	33 Manufacture of medical, precision and optical instruments, watches and clocks
DM	Manufacture of transport equipment
	34 Manufacture of motor vehicles, trailers and semi-trailers
	35 Manufacture of other transport equipment
DN	Manufacturing n.e.c.
	36 Manufacture of furniture; manufacturing n.e.c.
	37 Recycling

TABLE 2

Entry and Exit rates (country averages)

	Overall figures		Small firms (<20 empl)	
Country	Entry rate	Exit rate	Entry rate	Exit rate
Belgium	4.8%	5.7%	5.6%	7.0%
Denmark	5.8%	6.2%	6.6%	7.0%
Finland	5.1%	5.7%	5.7%	6.3%
Italy	5.7%	5.9%	6.1%	6.5%
Netherlands	5.6%	6.3%	6.7%	7.3%
Spain	6.8%	6.1%	7.9%	7.0%
Sweden	4.7%	4.8%	5.1%	5.2%
UK	8.3%	9.8%	9.5%	10.9%
Mean	5.8%	6.3%	6.7%	7.1%

TABLE 3

Entry and Exit rates (yearly averages)

	Overall figures		**Small firms (<20 empl)**	
year	Entry rate	Exit rate	Entry rate	Exit rate
1997		6.2%		6.8%
1998	6.9%	6.4%	7.9%	7.3%
1999	6.0%	6.4%	7.0%	7.1%
2000	5.8%	6.3%	6.7%	7.0%
2001	5.8%	6.1%	6.6%	6.8%
2002	5.5%	6.4%	6.3%	7.2%
2003	5.4%	6.5%	6.1%	7.4%

TABLE 4

Results from Exit regressions

Dep. var.: industry/country specific exit rate

	(1)	(2)	(3)	(4)	(5)
Entry Rate (t-1)	0.2538***	0.2505***	0.2473***	0.2497***	0.2471***
	(0.046)	(0.045)	(0.045)	(0.046)	(0.048)
TFP Growth (t-1)	0.0292	0.028	0.0217	0.02	0.0228
	(0.025)	(0.025)	(0.025)	(0.025)	(0.029)
K/L Growth (t-1)	-0.001	0.0025	-0.001	-0.0009	-0.0057
	(0.015)	(0.016)	(0.015)	(0.015)	(0.020)
Investment (t-1)	0.0028*	0.0027	0.0026*	0.0026*	0.0033
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Δ Openness (t-1)		0.0362*			
		(0.021)			
Δ Openness (t-2)		-0.0185			
		(0.022)			
Δ Imp Comp (t-1)			0.0604*	0.0641*	0.0957**
			(0.036)	(0.036)	(0.045)
Δ Exp Intensity (t-1)			0.0235	0.0247	0.0166
			(0.025)	(0.025)	(0.030)
Δ IIT Index			-0.0477**		-0.0551**
			(0.020)		(0.025)
*Δ IIT Index * High*				-0.0579***	
				(0.022)	
*Δ IIT Index * Low*				-0.0113	
				(0.053)	
Constant	0.0616***	0.0615***	0.0617***	0.0613***	0.0675***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.009)
industry dummies	yes	yes	yes	yes	yes
country dummies	yes	yes	yes	yes	yes
year dummies	yes	yes	yes	yes	yes
N. of obs.	331	331	331	331	302
R-sq	0.865	0.867	0.87	0.87	0.87

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 5

Results from Entry regressions

Dep. var.: industry/country specific entry rate

	(1)	(2)	(3)	(4)	(5)	(6)
Exit Rate (t-1)	0.1803***	0.1879***	0.1953***	0.2149***	0.2185***	0.1883***
	(0.055)	(0.054)	(0.054)	(0.052)	(0.052)	(0.054)
TFP Growth (t-1)	-0.0288	-0.0288	-0.0238	-0.0092	-0.0107	-0.0072
	(0.022)	(0.022)	(0.022)	(0.023)	(0.023)	(0.027)
K/L Growth (t-1)	-0.0486***	-0.0468***	-0.0472***	-0.0449***	-0.0454***	-0.0475**
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.020)
Investment (t-1)	0.0034**	0.0034**	0.0036**	0.0034**	0.0034**	0.0043**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Δ Openness (t-1)		0.006				
		(0.018)				
Δ Openness (t-2)		-0.0441**				
		(0.018)				
Δ Imp Comp (t-2)			-0.0335	0.1669	0.1529	0.145
			(0.041)	(0.105)	(0.106)	(0.121)
Δ Exp Intensity (t-2)			-0.0458**	-0.0468**	-0.0469**	-0.0703**
			(0.023)	(0.022)	(0.022)	(0.028)
Δ IIT Index (t-1)			0.0331**	0.0339**		0.0362**
			(0.015)	(0.015)		(0.017)
*Exit (t-1) * Δ Imp Comp (t-2)*				-0.0299**	-0.0283**	-0.0231*
				(0.014)	(0.014)	(0.013)
*Δ IIT Index (t-1) * High*					0.0442***	
					(0.017)	
*Δ IIT Index (t-1) * Low*					-0.0069	
					(0.029)	
Constant	0.0337***	0.0347***	0.0346***	0.0318***	0.0316***	0.0665***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)
industry dummies	yes	yes	yes	yes	yes	yes
country dummies	yes	yes	yes	yes	yes	yes
year dummies	yes	yes	yes	yes	yes	yes
N. of obs.	434	434	434	434	434	387
R-sq	0.707	0.711	0.714	0.717	0.72	0.72

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%