

Surviving Globalisation

Firm level evidence from Sweden 1980-1996

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Abstract

This paper investigates the effects of international trade on firms' decision to exit an industry by closedown, switching industry or being acquired. We use a rich dataset of Swedish firms that extends over two decades in which we could track the choice of each firm. We find that a higher level of international competition increases the probability of exit by merger and closedown compared to no change at all. When import penetration matters for firms that switch industries it is on those firms with the lowest levels of total factor productivity. If trade is more of an intra-industry character, the effect of import penetration on the probability of exit mitigates. Finally, we find that the origin of international competition is significant in the sense that the effects of trade on the exit decision of firms are strongest when trade is from OECD countries.

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Introduction

The process of globalisation offers both opportunities and costs to firms. The benefits result from access to larger markets, and therefore larger profits and possible economies of scale, and exposure to best practice management techniques and technologies. The costs result from greater competition. These opportunities and costs are not spread evenly amongst firms however. According to recent heterogeneous firm models (see for example Helpman, Melitz & Yeaple, 2003 or Bernard, Redding & Schott, 2004) the benefits are accrued to the best (the most productive) firms within the industry, whereas the costs are felt disproportionately by the least productive.

Perhaps the most visible of the ‘costs’ of globalisation, at least in the media, is the closure of domestic firms and the resulting loss of employment. This aspect of globalisation impacts greatest on domestic firms in the import competing sectors of the economy. Yet, while firm death represents one possible response of firms to increased international competition it is not the only option that they chose. For example, it is also the case that some firms rather than cease production altogether choose to switch production to a different industry or product, presumably choosing one in which domestic firms from that country have a competitive advantage. Others appear to hold the belief that size matters (because of scale economies), choosing to remain within their original industry but merge/acquire with another firm.

In this paper we test whether each of these choices depends on the level and structure of international competition, whether through foreign direct investment or arms length trade, and study which characteristics of firms make any one of these choices more likely. The reaction of firms in response to changes in the nature of international competition is an under-explored aspect of the globalisation process.

We consider these questions using data on Swedish manufacturing firms from 1980 to 1996. Sweden, as a small open economy, has high levels of exposure to international markets and therefore acts as an interesting test case. Foreign owned firms account for on average 25 per cent of output over the sample period, while there is also a very high proportion of firms engaged in exporting, on average over our sample period

around 85 per cent of firms export. This is much higher than one finds in larger OECD economies such as Germany, the UK and US. There is also evidence that in Sweden industry switching and merger/acquisition represent popular alternatives to the closure of the firm. In any one period around twice the number of firms choose to merge with other firms rather than close down, while about the same number of firms chose to switch (2-digit) industries as close.

From our analysis we find that while the view that globalisation leads to the closure of domestic plants has some truth, it is perhaps too simplistic a view. Increased import penetration does indeed significantly increase the probability of firm exit, although it is only true for the 1990's. More generally the positive effect of increased import penetration on exit leads to greater merger and acquisition activity and more closedowns within the industry, but the effect on the probability to switch between industries is insignificant. We do also find results that are consistent with the heterogeneous firm model since a firm's exit decision due to changes in different trade variables may depend on their TFP level and export and R&D status.

Heterogeneous Firms and International Trade

The recent literature on adjustment to globalisation has shifted away from the study of countries and industries to its impacts on plants and firms. Questions considered have included why only some firms export, why others become multinational and why some do neither, and what leads to entry and exit from these choices and from the industry more generally. The basic insight from this literature is that when faced with identical opportunities firms make different choices, where these differences in the choice made are explained by differences in the underlying characteristics of firms, typically their productivity. There is self-selection in the decisions of firms. For example, the least productive firms within an industry are those that are most likely to be forced to quit. Here we briefly review the theoretical and empirical evidence that relate to the question of firm exit, and how increased international competition may help to determine these choices in order to generate some hypothesis to test in the empirical section of the paper.

All of the recent extensions of the heterogeneous firm model to consider aspects of globalisation on firm choice build on the model of Hopenhayn (1992). Melitz (2003), which is perhaps the first paper developed along these lines, considers the export decision of firms in an industry with monopolistic competition and sunk-costs. Sunk-costs are incurred by the firm both to enter the industry and to enter export markets, where the sunk-costs of exporting are typically thought to include the fixed costs of research into product compliance, distribution networks, advertising *etc.* Only firms with higher *ex ante* productivity can meet the sunk-costs associated with entry and there is therefore, self-selection into export markets. Firms with lower productivity produce only for the domestic market, while firms with the lowest productivity exit the market.

Falling trade costs affects both the decisions about export market entry and industry exit. Falling trade costs, as expected, allows firms that were previously serving just the domestic market to make non-negative profits from serving foreign markets also. In addition, these profit opportunities in a larger market encourages the entry of new firms into the market. This additional entry has the effect of raising the minimum productivity level necessary to remain within the market, leading to the exit of some (low-productivity) non-exporting firms. Greater opportunities for exporting in the industry therefore lead to the closure of some firms. This has a positive effect on aggregate productivity in the industry because of the reallocation of resources— more productive (exporting) firms expand whilst less productive (non-exporting) firms contract or exit. Hence the model not only pins down a causal link between exporting and productivity at the firm level, but also between openness and productivity in the aggregate.

Bernard, Eaton, Jensen and Kortum (2003) yield similar insights using a static Ricardian model of exporting. In this model an increase in foreign competition (for example due to a reduction in trade costs) leads to an increased probability of firm death, where this probability is lower for export firms. The most efficient firm serves the domestic market and will also serve foreign markets if they are the lowest cost supplier to both markets (accounting for trade costs). Falling trade costs therefore decreases the productivity threshold that a foreign firm requires to dominate the domestic market (leading to the exit of the domestic firm), but where this probability

is decreasing in the productivity of the firm. Given by definition in the model, exporters have higher productivity than non-exporters, such that death is more likely for non-exporters.

Helpman, Melitz and Yeaple (2003) extend Melitz (2003) to consider the decision to set up an overseas affiliate, again subject to incurring a fixed cost. The model is again general equilibrium and yields the intuitively appealing result that the most productive firms engage in FDI, the next most productive export, whilst less productive firms produce only for the domestic market, with the least productive ceasing production altogether. As in the above models increased globalisation is likely to lead to firm exit, where the probability is decreasing in whether the firm is an exporter or multinational.

Falvey, Greenaway & Yu (2003) extend the Melitz model to consider asymmetries between countries. In that paper countries differ in the efficiency they use frontier technology. One interesting finding of the paper is that the degree of self-selection is stronger for industries in which the degree of substitution across products is higher, goods are more homogeneous. Therefore we might expect that the probability of firm closure is negatively correlated with the level of intra-industry trade in the industry. They also find that the higher the average efficiency of the country the more likely firms are to survive in the export market, but the less likely they are to survive in the more efficient country. We might therefore expect that the structure of trade is important. The pattern of trade is determined by the physical size of countries and the size of the efficiency gap. For a given efficiency difference, as the size of the country falls the domestic production of the differentiated product falls, whereas for a given size difference, as the efficiency gap rises the greater the domestic production of the differentiated product. The effect of trade liberalisation raises the minimum productivity of the firm needed to survive in the market, it raises the self-selection cut-off point. This effect is strongest however in the more efficient country.

Finally, Bernard, Redding & Schott (2003) develop a theoretical model to explain a second form of exit considered in this paper, that of industry switching.¹ Productivity levels are again shown to be important in this model, albeit in the context of a closed-economy. Here product switching depends on the fixed costs associated with the production of different products and heterogeneity in firm productivity. The more productive firms endogenously choose to produce products with higher sunk costs. Bernard & Jensen (2000) discuss the possibility of such an outcome in a model with international trade, but concentrate on the decision to exit. They argue that the Heckscher-Ohlin model would suggest that higher rates of exit would occur in industries in which the country has a comparative disadvantage, and lower exit rates in industries in which the country has an advantage. The paper recognises however, that the H-O model is silent on the issue of how this reallocation of resources would occur, firm exit, reductions in firm size or industry switching.

Although that paper does not outline a role for international competition on the choices made by these firms an effect from increased openness to trade is possible to envisage. Firms alter their output mix towards industries in which they have a comparative advantage and therefore avoid competition from countries in industries which they do not, perhaps because foreign countries are labour abundant. For OECD countries this is more likely towards the use of technologies with higher costs, where this decision is dependent on the productivity of the firm.

The prediction of which firms take the different choices available to all firms is unique to this type of model. For example, in Albuquerque & Rebelo (2000) consider the expected response of an economy to international trade, the re-allocation of resources across industries. They develop a two-sector model, an import competing sector and export-competing sector, with sunk-costs of entry. In this model trade liberalisation leads to the reallocation of firms from the import-competing sector to the export-competing sector. However because firms are identical all have an equal probability of switching industries. A similar conclusion is found in Tybout (2000), who finds that increased foreign competition causes a reallocation of output towards

¹ It is possible to get similar predictions about the cross-industry allocation of resources from other types of models, for example see Albuquerque & Rebelo (2000) or Tybout (2000). These models do

more efficient firms and from import-competing firms. This reallocation of resources may stem from the death of firms in the import-competing or their switch to a new industry.

Empirical Evidence

The empirical evidence in support of the relationship between industry exit and international competition exists largely for the US. Bernard, Jensen & Schott (2002) estimate probit regressions of plant death controlling for a number of firm characteristics and industry characteristics, where the latter include trade variables. Controlling for industry fixed effects they find that the probability of death is higher in firms with low productivity and in firms that are non-exporters. Declines in trade costs are found to result in greater levels of firm death in industries characterised by high intra-industry trade.

Along similar lines Gibson & Harris (1996) measure the effects of trade liberalisation on the probability of plant closure in New Zealand. The measures of trade liberalisation considered are the change in the effective rate of assistance to the industry and a measure of quotas within the industry. Both are found to significantly increase the probability of exit.

Bernard, Jensen & Schott (2002) consider both the decision to cease production and switch industries, although not in the same regression, following increased competition from low wage economies using plant-level data on the US manufacturing sector from 1977 to 1997. In the case of exit the authors find that the probability of firm survival is negatively correlated with low wage competition, and for a given level of wage competition it is firms with low capital and skill levels that are less likely to survive. While the determinants of switching are not considered in the same way there is evidence that industry switching occurs towards more capital-intensive and skill-intensive industries, exactly those industries with less competition from low-wage countries.

not predict however, how resources will be transferred across industries through such actions as firms

Bernard, Redding & Schott (2003) study part of the other choice considered in this paper, the determinants of industry switching at the firm level. This paper focuses on a narrower definition of product change than considered here, the choice is at the 5-digit level. They find however that close to 60 per cent of US manufacturing firms switch 4-digit product codes, 40 per cent switch 3-digit codes and over 20 per cent 2-digit codes during the sample period.

Plant death through increased exposure to international trade has an obvious counterpart in the loss of employment. In an extension of the Heckscher-Ohlin model to include unemployment, Davidson, Martin & Matusz (1999) conclude that unemployment rises in large capital-abundant countries that increase their trade with small labour-abundant countries. The effect of trade on employment has typically been studied empirically through changes in the exchange rate (for example see Grossman 1986, 1987; Branson & Love, 1988). Of those papers that use measures of the level of trade in combination with the exchange rate Revenga (1992) studies the effect of import prices interacted with industry import shares for 38 3-US manufacturing industries. She finds that the responsiveness of employment to changes in import prices depends positively on the degree of import penetration.

Data characteristics

The full set of observations within this study consists of 34,988 firm-year observations from 3,570 firms between 1980-1996, and around 8.5% of all these observations is some kind of industry exit.² We define an industry exit as a closedown when both the firm identifier and all plant identifiers connected to this firm disappears from the sample. If the firm's identifier disappears while one or several plant identifiers continue under another firm, the exit is defined as an exit by merger or acquisition (M&A exit henceforth). Finally, firms may exit a particular industry by switching to another industry, which happens when the largest share of employees is found under a new 2-digit industry classification. We focus on the decision to switch

moving industries.

² We are restricted to firms with more than 49 employees since Sweden Statistics only collects information on export and R&D expenditures from these firms. The dataset used in the regressions is further restricted since we only consider firms that exists, within the dataset, for at least two years.

2-digit industries to maximise the size of the jump made by firms. This has several advantages: firstly, it makes it more likely that switching is not due to some sort of mistake in filling out the questionnaire that underlies the data collection process. Secondly, we presume that the investment necessary to switch 2-digit industries is greater than that necessary to switch, for example, 4-digit codes within any 2-digit industry. We consider the robustness of the results to industry switches at a more disaggregated level below.

In Table 1 we provide some detail on the year in which these different forms of exit take place as a percentage of the total number of observations for each year, and the characteristics of firms that makes these choices. Firm exit is in the case of Sweden relatively common; exit by one of the forms considered makes up around 8.5 % of observations in any one year. Around half of all these exits are M&A exits while there is about the same amount of closedowns and industry switches (at the 2-digit level). Exit by each of the three methods considered in the paper lead to a transformation of the industry due to a realisation of resources, management control changes, and the reallocation of market-share.

Industry switching peaks in the years 1989 and 1990, where they account for 6 and 14.7 per cent of total observations in those years respectively. This increase in switching reflects however a break in the Swedish industry classification used by Sweden Statistics (the source of the data) from SNI69 to SNI92. To minimise the effect of this change in classification we use a key provided by Sweden Statistics in order to translate the former to the latter for the whole period. This break in the classification system may lead to some idiosyncratic switches to remain within the data. For this reason we focus on firms that switch between broad industry groups, control for the break years using year-specific dummies and finally by excluding 1989-90. The results remain robust to these changes.

Table 1 also reports the results from a test of differences in means between the control group (continuing firms) and the three forms of exiting firms. The results from this simple test indicate that the type of firm choosing these alternative forms of exit differ from each other, supporting the heterogeneous models discussed in the previous section. Firms that switch industries tend to be less productive, more capital intensive

(physical and human), larger, and more export oriented. The group of closedowns seems to have the reverse relationship while the group of M&A seems to have the capital intensity and size as continuing firms and lower means in all other variables.

Furthermore, we investigate the relevance of switching industries by comparing the characteristics of the industry these firms are leaving to the destination industry. We find that firms tend to switch towards more capital intensive (both physical and human), and more productive, in terms of labour productivity, industries, which indicate that this type of exit has real impact on the economy.

The probability of exit

The discussion above underscores, both theoretically and empirically, that trade liberalisation affects resource allocation within and between industries due to closedowns, industry switches or merger and acquisitions. Furthermore, resource allocation due to international trade may stem from a higher trade itself (a higher import penetration or a larger export market), but also from different kinds of trade (intra or inter-industry trade) as well as different origins. However, no study, to our knowledge, examines the effects of international trade on these decisions simultaneously.³

Table 2 reports the results from a multinomial logit regression based on the decision matrix facing each firm: continue its business as before, switch industry, merge or closedown. All of the reported coefficients are expressed relative to the firm making no change in its operating status.

Whilst firm level characteristics are not of primary interest in this paper a number of differences between the exit choices emerge that are worth highlighting. Firms that exit the industry by ceasing production are characterised as being smaller and younger, though not significantly, compared to those that stay, and are less likely to export. They are also more likely to be foreign owned and operate in industries with high sunk costs. In many ways these characteristics are similar to those of firms that

exit by switching industries, except where these firms tend to be exporters that already have a number of plants. Finally, acquired firms are older, more productive and non-exporting domestically owned firms. Aside from a few relatively minor differences these are consistent with the results found in Greenaway, Gullstrand & Kneller (2003) and more detail on the results can be found in that paper.

From the base regression it would appear that international trade does not have a common impact on the three exit choices considered. Relative to no change in the status of the firm we find that mergers and acquisitions are more likely as import penetration in the industry increases and as the level of intra-industry trade is high, but less likely when this import penetration is of an intra-industry form. The same relationship is found for firm closure, which is in line with the popular impression that greater import penetration leads to increased rates of closure of domestic firms. Trade variables do not seem however, to have any effect on the propensity to belong to the group of firms that switch industries, except for firms that originate in a comparative advantage industry where switch is more likely.⁴ And if we use firms that exit by closedowns as a base instead of continuing firms, we find that the trade variables do not affect the propensity of belonging to the M&A group while the propensity of belonging to the group of switching firms decreases with import penetration and increases as this penetration is of an intra-industry form.

When we compare the results in Table 2 with a regression excluding 1989 and 1990, we find no big changes for firms that exit by M&A or closedown. We find, however, that the significance for some trade variables increase for firms that switch industries, and we therefore exclude these two years from the regressions below. In this restricted sample we find that it is more likely to switch than to continue within the same industry, if the import penetration in the originating industry is high and the import is of an inter-industry character. The comparative advantage dummy becomes insignificant however. We do also check the robustness after a redefinition of an industry switch to a change at the 4-digit level, but the results for the trade variables are unchanged.

³ Variable definitions and descriptive statistics are found in Table 5.

⁴ The switch from one industry to another is booked the year it occurs, which implies that all industry variables are fixed to the destination industry.

Although the average effect of the trade variables is in line with our expectations, we may expect that the effects differ between firms with different characteristics as in the heterogeneous firm model of export behaviour in Melitz (2003). In that model firm closure is driven not by the increased number of importers, which has the effect of reducing profits for all firms, but the entry of new firms. That is, the various trade variables may be a more pertinent problem for firms with given underlying characteristics, for example low productivity and no export or R&D activities.

This is, to some extent, indeed what we find. In Table 3, regression 2, we report the results from a multinomial logit regression in which we add interaction terms between TFP and import penetration and TFP and our measure of intra-industry trade. While the results for the previous trade variables remain unchanged we do find some evidence that where import penetration is important for industry switching it is on those firms with the lowest levels of TFP. If we use R&D activities as a characteristic instead of TFP (regression 4), we find that import penetration is more likely to increase the propensity of belonging to the M&A group if firms do not employ R&D activities.

The characteristics of firms seem also to be important for how the structure of trade influence industry turnover (in the form of exit by M&A or closedown). The results above indicate that firm turnover is more likely in industries that is characterised by a high degree of intra-industry trade, and the result in regression 2 shows that it is more likely that the more productive firms are acquired. On the other hand, the trade effect of the degree of intra-industry trade is of a more pertinent problem for firms that do not employ export or R&D activities. This would appear to confirm the prediction of the heterogeneous firm model that international trade impacts differently across firms, where this difference is explained by firm characteristics such as productivity and export or R&D activities.

In regressions 5 and 8, Table 4, we repeat the above analysis but allowing the effect of imports to differ according to their source. That is we separate the import penetration variable into the part from other OECD countries and the part from non-OECD

countries.⁵ Comparing regression 1 with regression 5 we find that many of the effects of trade on the exit decision of firms is strongest when trade is from OECD countries. According to the results, import penetration from OECD countries affects the likelihood of industry switching, and this effect is lower when import penetration is more of an intra-industry form.

Furthermore, it is import penetration from OECD countries that is more important, in terms of significance level and coefficient size, for M&A and the positive effect decreases if this penetration is of an intra-industry form. Finally, import penetration from the rest of the world only affects M&A and firm failure directly and not indirectly through the type of trade.

Again the heterogeneous firm model seems to be valid since the interaction between TFP and import penetration (see regression 8) is negative and significant for switching industries using the non-OECD measure but not the OECD measure. That is, when trade is from non-OECD countries the likelihood of industry switching is increasing as TFP decreases. The results from the interaction of import penetration with TFP do not reveal whether the effect on the decision to closedown is strongest for OECD trade or non-OECD trade however.

In the final regressions we consider whether the effect of trade on the choice of firms has altered over time by splitting the sample to pre and post 1990. In regression 6-7 of Table 4 we report the results for a regression of the same form as regression 5 but for the 1980's and the 1990's. From these regressions there are evidence of a number of differences in the effect of the trade variables across time. The strong positive effects of import penetration appear to be explained by the effects of this variable in the 1990's rather than the 1980's, where although the signs remain the same, on the whole, the estimated coefficients are statistically insignificant.

⁵ Our OECD is composed of the 24 rich members (defined by the World Bank).

Summary and conclusions

This paper has investigated the effects of international trade on firms' decision to exit an industry by death, switching industry or being acquired. We have used a rich dataset of Swedish firms that extends over two decades in which we could track the industry choice of each firm with the help of plant and firm level information. With this dataset we were able to test whether the choices depend on the level, structure and the origin of international competition. We found that all three dimensions were important.

We found that as the level of international competition increased, the more likely that firms exit by merger and closedown compared to no change at all. We did not, however, find a similar correlation regarding the probability to switching industries.

We did also find results that were consistent with the heterogeneous firm model of export behaviour since our results indicated that firm characteristics, such as total factor productivity and export or R&D activities, influence how firms react on trade variables. We found, for example, that when import penetration is important for the decision to switch industries, it is for those with low total factor productivity.

The results supported that the structure of international competition matters indirectly as well as directly. A greater share of intra-industry trade increases the probability of firm turnover (in the form of merger and acquisition and closedown) while it moderated the effect of import penetration.

The importance of the origin of international competition showed to be significant in the sense that we found that many of the effects of trade on the exit decision of firms was strongest when trade was from OECD countries.

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Tables

Table 1: *Industry exits.*

	Switches	Mergers/acquires	Closedowns
% of total observations			
1982	1.4	4.7	1.6
1983	1.4	2.6	1.3
1984	1.7	3.1	1.2
1985	1.3	4.5	0.8
1986	0.9	3.9	1.7
1987	1.1	5.3	1.4
1988	0.2	3.9	1.3
1989	6.0	4.5	2.0
1990	14.7	1.7	1.2
1991	2.8	5.8	2.3
1992	1.6	6.3	2.9
1993	2.8	3.7	0.6
1994	1.9	2.8	0.4
1995	1.6	3.6	0.7
Full sample	2.9	4.0	1.4
Difference of means tests ^a (compared to continuing firms)			
Total factor productivity	Lower	Lower	Equal
Capital per labour	Higher	Equal	Lower
Size	Higher	Equal	Lower
Export dummy	Higher	Lower	Lower
R&D dummy	Higher	Lower	Lower
Notes: ^a A differences of means test between a group of exiting firms (switches, M&A or closedowns) and continuing firms for the whole period. Lower/higher indicates that the mean is higher/lower for the exit group at a 10 % significance level.			

Table 2: *Multinomial regression, 1, (continuing firm as base).* ^a

Variables	Switch	Merged or Aquired	Closedown
<i>Proportion of total sample</i>	2.9%	4.0%	1.4%
Size	-0.45 (0.00)	0.001 (0.99)	-1.03 (0.00)
Age	-0.16 (0.41)	0.32 (0.09)	-0.33 (0.26)
TFP	-0.05 (0.02)	0.22 (0.04)	-0.06 (0.17)
Capital per employee	0.12 (0.31)	-0.11 (0.10)	-0.31 (0.00)
Export dummy	0.15 (0.21)	-0.55 (0.00)	-0.71 (0.00)
Multiplant dummy	0.55 (0.00)	-0.04 (0.71)	-0.17 (0.32)
Foreign owner dummy	-0.17 (0.14)	-0.32 (0.00)	0.42 (0.01)
Intermediate producer	0.57 (0.04)	-0.71 (0.02)	-3.32 (0.00)
Demand shock	0.74 (0.00)	-0.73 (0.02)	0.17 (0.66)
Changes in labour force	-0.07 (0.89)	-2.61 (0.00)	-4.34 (0.00)
Sunk costs	-1.18 (0.79)	7.63 (0.17)	-28.41 (0.00)
Import penetration (IMPEN)	-0.001 (0.95)	0.61 (0.01)	1.04 (0.02)
Gruble-Lloyd index (GL)	0.003 (0.18)	0.004 (0.09)	0.01 (0.02)
IMPEN_GL	0.0001 (0.97)	-0.007 (0.02)	-0.01 (0.02)
Comparative advantage dummy	-0.36 (0.00)	0.05 (0.55)	-0.08 (0.63)
Percent correctly predicted: 92%			
McFadden's pseudo R ² : 0.10			
Notes: ^a Variable definitions are found in Table 5. Year and 2-digit industry dummies are included in the regression. Figures between parentheses are p-values, and bold coefficients are significant at least at a 10 % level.			

Table 3: *Multinomial regressions, 2-4, (continuing firm as base).^a*

	(2) Excl 1989-90 X=TFP	(3) Excl 1989-90 X=Export dum	(4) Excl <1985 and 1989-90 X=R&D dum
<u>X IMPEN</u>			
Switch	-28.79 (0.09)	89.66 (0.47)	-112.56 (0.12)
M&A	0.01 (0.71)	-34.27 (0.51)	-83.16 (0.10)
Closedown	-1.19 (0.98)	265.68 (0.14)	-17.80 (0.92)
<u>X GL</u>			
Switch	-2.00 (0.15)	10.81 (0.14)	4.77 (0.51)
M&A	1.16 (0.08)	-6.35 (0.08)	-12.45 (0.00)
Closedown	0.11 (0.94)	-11.33 (0.04)	-4.79 (0.51)

Table 4: *Multinomial regressions, 5-8, (continuing firm as base).^a*

	(5) Excl 1989-90	(6) 1980's	(7) 1990's	(8) Excl 1989-90
<u>IMPEN OECD</u>				
Switch	-0.38 (0.09)	-0.40 (0.36)	-0.44 (0.17)	-0.42 (0.06)
M&A	0.61 (0.01)	0.44 (0.27)	1.00 (0.00)	0.62 (0.00)
Closedown	1.04 (0.02)	0.26 (0.69)	1.24 (0.10)	1.03 (0.02)
<u>IMPEN RoW</u>				
Switch	-0.44 (0.21)	3.48 (0.51)	-0.52 (0.25)	-0.45 (0.25)
M&A	0.51 (0.10)	-1.33 (0.61)	0.88 (0.04)	0.56 (0.07)
Closedown	1.07 (0.05)	2.68 (0.41)	1.32 (0.10)	1.06 (0.06)
<u>GL</u>				
Switch	0.001 (0.66)	0.008 (0.18)	0.003 (0.51)	0.001 (0.95)
M&A	0.003 (0.10)	0.002 (0.56)	0.006 (0.07)	0.004 (0.07)
Closedown	0.01 (0.02)	0.001 (0.84)	0.01 (0.05)	0.01 (0.02)
<u>GL IMPEN OECD</u>				
Switch	0.005 (0.11)	0.002 (0.78)	0.005 (0.17)	0.005 (0.07)
M&A	-0.007 (0.02)	-0.004 (0.35)	-0.01 (0.01)	-0.007 (0.01)
Closedown	-0.01 (0.01)	-0.002 (0.75)	-0.017 (0.07)	-0.01 (0.02)
<u>GL IMPEN RoW</u>				
Switch	0.003 (0.62)	-0.03 (0.70)	-0.001 (0.93)	0.001 (0.92)
M&A	-0.01 (0.11)	0.01 (0.75)	-0.004 (0.58)	-0.01 (0.11)
Closedown	-0.01 (0.21)	-0.04 (0.38)	-0.01 (0.25)	-0.01 (0.21)
<u>CA</u>				
Switch	-0.37 (0.00)	-0.31 (0.22)	0.09 (0.67)	-0.37 (0.00)
M&A	0.05 (0.60)	0.20 (0.16)	0.15 (0.38)	0.05 (0.62)
Closedown	0.58 (0.13)	-0.11 (0.69)	-0.03 (0.93)	0.08 (0.64)
<u>TFP IMPEN OECD</u>				
Switch				-0.21 (0.93)
M&A				-0.10 (0.96)
Closedown				-0.001 (0.99)
<u>TFP IMPEN RoW</u>				
Switch				-33.77 (0.00)
M&A				2.68 (0.72)
Closedown				-7.82 (0.73)
<u>TFP GL</u>				
Switch				-1.21 (0.23)
M&A				1.00 (0.11)
Closedown				0.29 (0.83)

Table 5: *Definitions and descriptive statistics for variables in regression 1*

Variables	Mean	Standard deviation
Size (ln[# employees])	2.12	0.40
Age (ln[# years in sample])	0.81	0.24
TFP (total factor productivity) ^a	-0.30	2.62
Capital per employee (ln[capital stock/#employees])	-0.03	0.49
Export dummy (one if the firm is exporting)	0.77	0.42
Multiplant dummy (one if the firm has more than one plant)	0.25	0.43
Foreign owner dummy (one if the firm is owned by a foreign company)	0.18	0.38
Intermediate producer (value added as share of total sales)	0.37	0.13
Demand shock (stock as a share of total sales)	0.19	0.15
Changes in labour force (ln(# employed in t)- ln(# employed in t-1))	0.002	0.07
Sunk costs (-minimum of industry entry and exit rates at a 4-digit level) ^b	-0.004	0.008
Import penetration (import/(domestic production - export + import)) ^c	0.45	20.92
Gruble-Lloyd index ([1-(export-import /(export+import))]*100) ^c	70.34	24.97
Comparative advantage dummy (one if export >import) ^c	0.53	0.49

Notes: ^a The firm-level TFPs are estimated as in Levinsohn and Petrin (2000), but with investment to control for unobservables due to the lack of input information. ^b See Bernard and Bradford Jensen (2002). ^c Trade variables are calculated at a SNI69 5-digit level before 1995, and at a SNI92 4-digit level after 1994.