

Gross job flows and firms' international activities

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Introduction

It is generally acknowledged that, owing to the economy's high degree of openness, the evolution of employment in Belgium is greatly affected by external trade and by the strategic decisions of multinational companies located there. That issue is even more acute at present, against the backdrop of the increasing presence of low-wage countries on international markets and the attractions of those countries for foreign investors.

This article summarises the results of an empirical study on that subject. The main original feature of the study is that it was conducted using a microeconomic database containing firm-level data on non-financial corporations located in Belgium. It includes various data taken from the annual accounts filed with the Central Balance Sheet Office and other information, also collected by the National Bank of Belgium, relating to international trade in goods and foreign direct investment (FDI).

One advantage of using microeconomic data is that it makes it possible to take account of the heterogeneity of businesses. Even within very narrowly defined sectors, significant disparities between firms may in fact emerge. In particular, such data permit analysis of the trend in employment by distinguishing between job creation attributable to certain firms and, simultaneously, job destruction attributable to others. These gross job flows, which tend to be much larger than the net fluctuations, cannot be observed in aggregate statistics such as those obtained from the national accounts. It is quite important to take them into consideration since they typify the redeployment of labour between firms in a context of

structural changes in economic activity. As well as assessing the impact of international trade and FDI on the level of employment in Belgian firms, this study aims to evaluate their role in that process.

The article is structured as follows. Section 1 gives a brief description of the database used and the population of firms covered. Section 2 gives an account of the importance of international activities within that population, in terms of both foreign trade and direct investment. Section 3 offers an initial assessment of the impact of these activities on employment on the basis of descriptive statistics. Section 4 then verifies the robustness of these results via an econometric analysis. The study's main findings are summarised in the conclusion.

1. Description of the data

The database used for this study was compiled from three sources of information collected by the Bank for its statistical work and tasks in the public interest, with due regard for their confidentiality. These three sources are:

- The annual accounts filed with the Central Balance Sheet Office by firms incorporated under Belgian law; these accounts provided data on the number of employees expressed in full-time equivalents (FTEs), productivity and profitability.

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- The results of the survey of direct investment. Conducted annually by the Bank since 1997, this survey records companies owning at least 10 p.c. of the capital in a non-resident firm, and companies which are at least 10 p.c. owned by a foreign firm. It thus makes it possible to identify Belgian subsidiaries of foreign firms and Belgian multinationals – i.e. firms owning shares in foreign companies without themselves being owned by a foreign shareholder – as opposed to firms which have no significant investment link with non-residents.
- The foreign trade figures which the Bank has collected on behalf of the National Accounts Institute since January 1995. Covering trade in goods between Belgium and the rest of the world, these data can be used to identify firms involved in international trade.

A total of six mutually exclusive groups of firms were formed for the purposes of the analysis, namely subsidiaries of foreign firms and Belgian multinationals; then – out of those with no FDI links – exporters, importers, and two-way traders, i.e. firms active in both export and import; finally, there are the “purely domestic” firms. However, it should be noted that in the majority of cases subsidiaries of foreign firms and Belgian multinationals are also exporters and/or importers of goods.

In view of the data availability, the analysis concerns a period beginning in 1997, the first year for which the survey of direct investment produced results, and ending in 2005.

In 2005, some 316,360 Belgian firms filed annual accounts with the Central Balance Sheet Office. However, the analysis covers firms employing at least one full-time or part-time worker, as these are the only firms relevant for explaining the evolution in the number of employees. Thus, the number of firms taken into account totals around 138,000.

It is important to note that the aggregate statistics which can be compiled on the basis of this population of firms are not entirely comparable with other sources, especially the national accounts. While the Central Balance Sheet Office data concerns only non-financial corporations, the national accounts also relate to financial corporations, as well as non-market services and general government. Moreover, the national accounts data on employment is compiled on the basis of the social security data. Finally, unlike the employment figures used in this article, the national accounts statistics are not expressed in terms of the number of FTE jobs.

Despite these methodological differences, the aggregate microeconomic data has similarities with the national accounts statistics; those similarities are reflected, in particular, in the sectoral breakdown of employment. According to both sources, services account for the majority of jobs in Belgium. In 2005, they represented 73 p.c. of the number of firms and 60 p.c. FTE employees according to the microeconomic data, compared to 64.1 p.c. of the number of employees according to the national accounts. In addition, wholesale and retail trade

TABLE 1 BREAKDOWN OF THE POPULATION OF FIRMS BY INDUSTRY
(percentages of the total, unless otherwise stated)

	Number of firms		Jobs in FTEs		<i>p.m.</i> Number of employees according to the national accounts ⁽¹⁾	
	1997	2005	1997	2005	1997	2005
Agriculture, fishing, mining and quarrying	1.9	2.1	0.8	0.9	1.2	1.3
Manufacturing	14.6	11.4	35.0	28.5	29.9	25.1
Recycling, utilities and construction	13.7	13.4	11.0	10.5	10.1	9.5
Services	69.6	73.0	53.1	60.0	58.7	64.1
Wholesale and retail trade	33.9	31.2	20.1	21.3	19.2	20.9
Other services	35.6	41.9	33.0	38.8	39.5	43.2
Total	100	100	100	100	100	100
<i>p.m. Total number (thousands)</i>	109	138	1,655	1,848	2,094	2,283

Sources: NAI, NBB (Central Balance Sheet Office)

(1) Employment in general government, non-market services and financial institutions was excluded to obtain a sectoral coverage similar to that of the Central Balance Sheet Office data.

account for a significant number of jobs. Industrial firms represent 11.4 p.c. of the total number of firms, but are larger on average than service firms as they account for 28.5 p.c. of employment in FTEs according to the microeconomic data, and 25.1 p.c. according to the national accounts.

Furthermore, as in the case of the national accounts, the comparison of the 2005 figures with those for 1997 reveals the decline in employment in the manufacturing sector and the growing importance of service activities. In fact, the share of manufacturing in the total number of employees in the market sector has fallen by 6.5 percentage points according to the microeconomic data, and by 4.8 percentage points according to the national accounts. On the basis of these similarities, it appears that microeconomic data such as those used here can help to explain phenomena apparent at macroeconomic level, even if their coverage is not exactly the same as that of the statistics most commonly used.

This study considers three main industries on account of their significant involvement in international trade and/or in FDI.

Taken as a whole, firms in manufacturing and trade account for around 90 p.c. of exports and imports of goods. Industry dominates on the export side, with a share of 67 p.c. compared to 25.3 p.c. for trade. In the case of imports, the shares of the two industries are more evenly balanced, with 45.8 p.c. for manufacturing

industry and 42.8 p.c. for trade, owing to the role that firms in the latter perform in delivering foreign-made goods to Belgian customers.

Other service firms are only marginally involved in international trade in goods (imports of capital goods, etc.). Moreover, there is no microeconomic data on international trade in services. However, the latter is small in scale compared to international trade in goods: according to the balance of payments statistics, it represented 17 p.c. of trade between Belgium and the rest of the world in the period 1997-2005. Conversely, service activities other than trade, and particularly the coordination centres, account for the major part of Belgium's total inward and outward FDI. That is why they are considered in this study.

The three industries – manufacturing, trade and other services – will also be discussed separately, as the interactions between international trade, FDI and employment are determined by factors specific to each of them. In particular, while the trade industry is usually confined to acting as intermediary between producers and consumers, manufacturing firms are able to outsource part of their production to other countries, and that may have more significant repercussions on employment in the country of origin. In the trade sector, the decision to establish foreign subsidiaries is motivated mainly by the desire to serve new markets. In the case of manufacturing firms and certain service firms, it may also result from the attempt to obtain better production conditions by relocating part of the value added chain.

TABLE 2 BREAKDOWN OF FOREIGN TRADE IN GOODS AND FOREIGN DIRECT INVESTMENT BY INDUSTRY
(2005 data; percentages of the total)

	Foreign trade		Foreign direct investment stock ⁽¹⁾	
	Exports	Imports	from Belgium	in Belgium
Agriculture, fishing, mining and quarrying	0.5	0.2	1.2	2.2
Manufacturing	67.0	45.8	24.7	19.2
Recycling, utilities and construction	4.9	8.4	2.7	2.9
Services	27.6	45.5	71.3	75.6
Wholesale and retail trade	25.3	42.8	5.3	8.2
Other services	2.3	2.8	66.1	67.4
of which: coordination centres	0.0	0.0	33.1	28.7
Total	100	100	100	100

Source: NBB.

(1) Excluding that attributable to financial institutions; including equity capital held via indirect ownership and intra-group loans.

2. Firms active in the international markets

2.1 Concentration of international activities

The aggregate statistics derived from the microeconomic database permit a distinction between purely domestic firms, exporters and/or importers, Belgian multinationals and subsidiaries of foreign companies. This shows that a relatively small number of firms engage in one or other form of international activity via trade or direct investment. However, these firms are important in terms of employment.

Purely domestic firms represent just over 80 p.c. of the population, though that proportion varies considerably between sectors. In manufacturing and whole sale and retail, firms serving only the local markets correspond respectively to 58.7 and 65.4 p.c. of the total. Conversely, they are decidedly dominant in other service activities – where they represent 92.8 p.c. – notably because of the importance of personal services (hotels and restaurants, etc.) and business services.

The figures for manufacturing industry also reflect the international fragmentation of the production chain. Firms active in both export and import represent 21.2 p.c. of the total number of industrial firms, while firms which only export or only import account for just 7 and 8.4 p.c. respectively. In the trade sector, there are more firms

involved only in importing, owing to the role of these firms in supplying consumer goods for the local market.

On average, firms active on the international markets employ more staff, reflecting their relatively greater importance in the Belgian economy. This applies particularly to the subsidiaries of foreign firms which, though accounting for only 1.3 p.c. of the number of firms, employ 25.3 p.c. of the staff of resident enterprises. Their weight is greatest in manufacturing industry, where they represent 40.6 p.c. of employment. A large proportion of the jobs in trade and other services are also attributable to them.

The fact that trade and investment links with other countries concern only a small number of firms is also reflected in a high degree of concentration in the volume of Belgium's exports and imports. The concentration of the trade flows in the two sectors where they are significant, namely manufacturing industry and trade, can be illustrated by means of Lorenz curves.

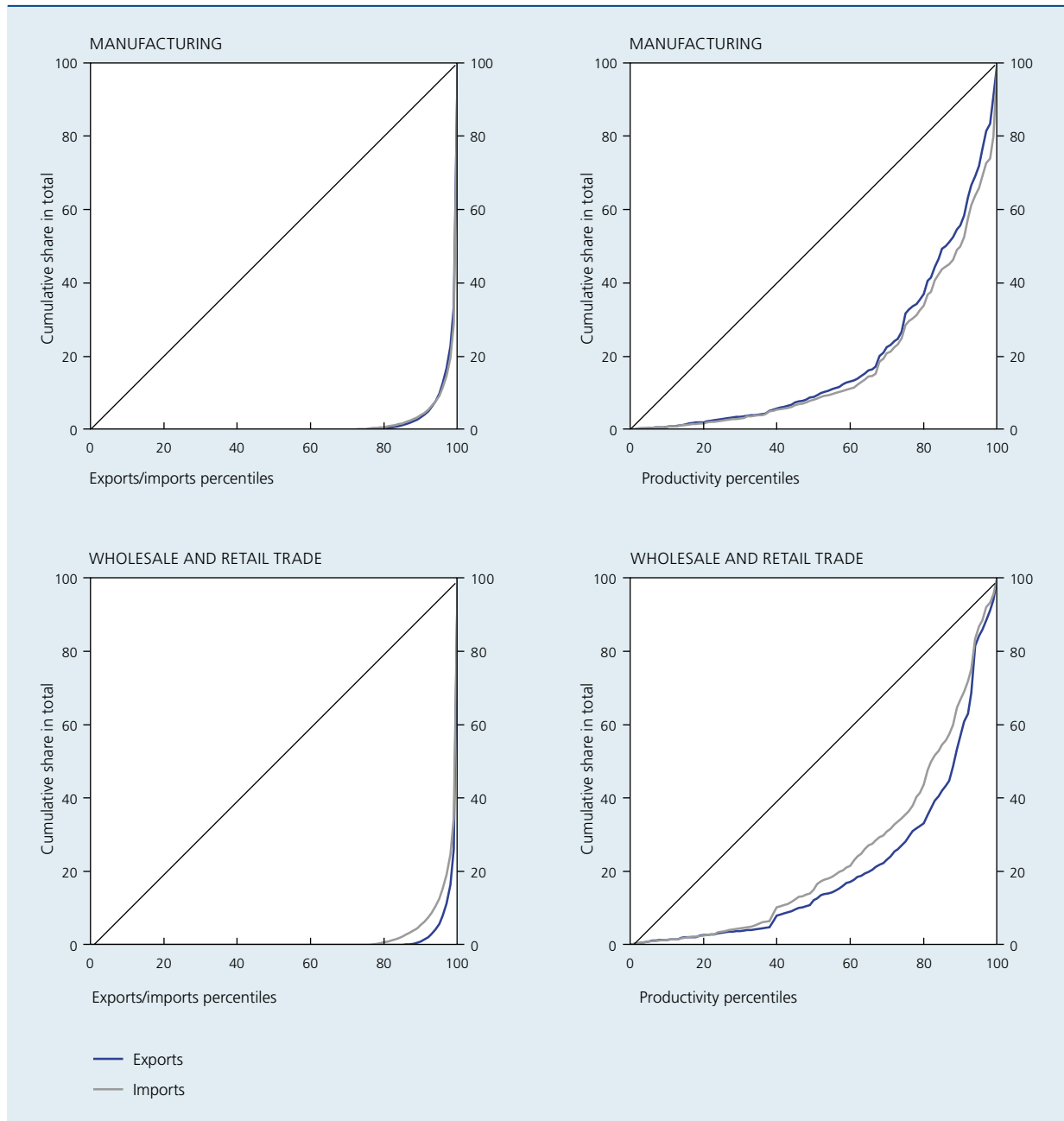
In the two sectors considered, fewer than 10 p.c. of firms account for over 90 p.c. of the foreign trade in goods. It is also essentially the most productive firms which are active in this area. In manufacturing industry, firms in the last decile of the ranking according to productivity levels accounted for 44 p.c. of exports and 50 p.c. of imports in 2005. A similar phenomenon is also evident in the trade sector, though the concentration of imports is less marked there than in manufacturing.

TABLE 3 BREAKDOWN BY CATEGORY OF FIRMS
(2005 data; percentages of the total)

	Total		Manufacturing		Wholesale and retail trade		Other services	
	Number of firms	Jobs in FTEs	Number of firms	Jobs in FTEs	Number of firms	Jobs in FTEs	Number of firms	Jobs in FTEs
Purely domestic firms	80.3	35.9	58.7	10.8	65.4	27.0	92.8	51.5
Exporters	3.6	3.1	7.0	2.7	5.8	5.3	1.6	2.1
Importers	6.9	7.6	8.4	5.0	14.0	12.4	2.5	5.7
Two-way traders	7.6	17.8	21.2	30.0	13.4	25.4	1.6	7.5
Belgian multinationals	0.3	10.2	1.0	10.9	0.2	7.7	0.3	13.6
Foreign firms	1.3	25.3	3.6	40.6	1.2	22.2	1.2	19.6
Total	100	100	100	100	100	100	100	100

Source: NBB.

CHART 1 CONCENTRATION OF TRADE FLOWS AMONG THE MOST PRODUCTIVE FIRMS
(results for 2005)



Source : NBB.

2.2 Characteristics of firms active in the international markets

Various empirical studies have found that the most productive firms are also those most active in the international markets, and the theoretical literature explains why.

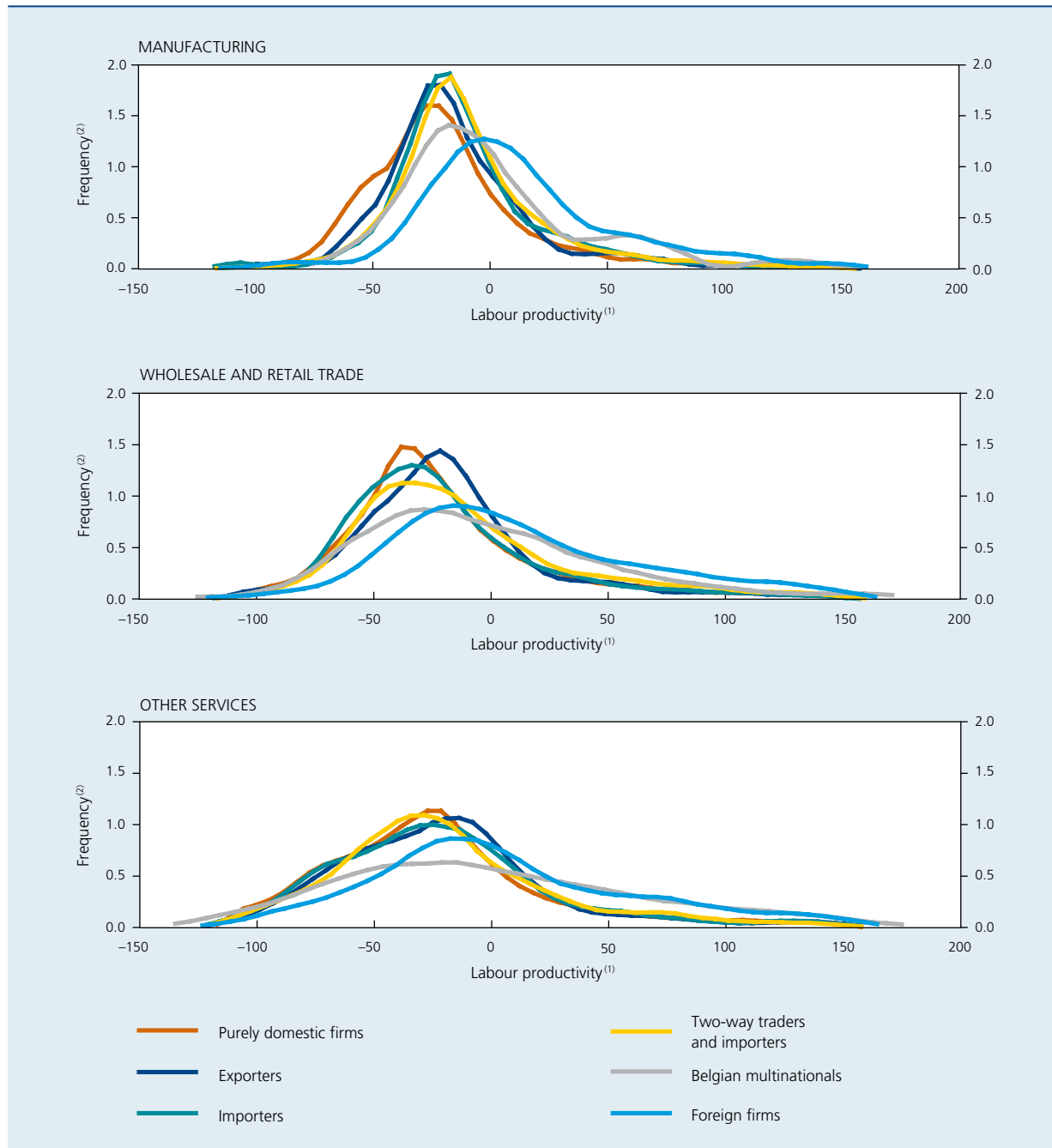
On the basis of a microeconomic approach whereby firms with heterogeneous characteristics can coexist within the same industry owing to imperfect competition on the goods market, the theoretical models predict that only the most productive firms will be able to afford the costs entailed in entering foreign markets⁽¹⁾. In the case

(1) Cf. in particular Melitz (2003), Helpman, Melitz and Yeaple (2004), and Kasahara and Laphan (2007).

of exports, such costs include those arising from market research, the search for partners to establish a distribution network, the need to adapt the products according to local preferences or to make them conform to foreign quality standards, etc. In the case of imports, the existence of fixed costs is due, for example, to the search for foreign

suppliers. Apart from these various fixed costs, international trade in goods entails a number of variable costs relating in particular to freight transport and customs duties, which can be avoided by direct investment, namely by establishing production units close to the markets to be served. As a general rule, the costs associated with direct

CHART 2 DISTRIBUTION OF LABOUR PRODUCTIVITY BY CATEGORY OF FIRMS
(results for 2005)



Source : NBB.

(1) Value added per full-time equivalent, in thousands of euro; the difference between the result for the firm and the average productivity of the industry (NACE, four digits) to which it belongs. For clarity, firms below the 5th percentile and above the 95th are not represented in the productivity distributions.

(2) As a percentage.

investment are higher than those relating to exports since they concern either the creation of one or more foreign subsidiaries or the acquisition of shares in existing companies. For that reason, the theoretical models predict that, when given the opportunity to sell part of their output abroad, the most productive firms with the greatest financial resources will do so via direct investment, while those whose productivity is at an intermediate level will resort to exporting. The least productive firms will continue to operate on a purely domestic level.

From an empirical point of view, the use of firm-level data for the United Kingdom, Ireland and Germany, in particular, made it possible to show, on the basis of the distribution of productivity specific to each category of firms, that multinationals are generally more productive than exporting firms, the latter being themselves more productive than purely domestic firms⁽¹⁾.

A similar analysis was done on the basis of the data available for Belgium. Here it should be noted that, thanks to the use of the Central Balance Sheet Office data, the population of firms covered is much larger than that of the samples used in studies on other countries. The distribution of labour productivity specific to each category of firms was reproduced separately for manufacturing, trade and other services. That approach makes it possible to take account of the heterogeneity of firms belonging to the same category, the level of productivity being highly variable. Owing to this heterogeneity, more conventional indicators such as average or median productivity would not be very representative.

In manufacturing, the labour productivity distributions display a fairly clear hierarchy. With distribution curves shifted to the right in comparison with those of the other categories of firms, the subsidiaries of foreign firms and the Belgian multinationals are significantly more productive. They are followed by two-way traders, and by firms which only import, whose distribution curves coincide. The latter are more productive than firms involved only in exporting. Finally, purely domestic firms appear to be the least productive. The greater productivity of subsidiaries of foreign firms and Belgian multinationals is also very marked in the wholesale and retail trade sector. However, it is more difficult to discern any clear hierarchy between the levels of productivity of the other categories of firms, as the distribution curves are relatively close. A similar profile is found among firms operating in other service activities.

Generally speaking, the differences in labour productivity levels between Belgian firms is consistent with the results obtained for other countries. This finding mainly concerns subsidiaries of foreign firms and Belgian multinationals, which tends to confirm that the fixed costs associated with foreign investment often exceed those relating to foreign trade. The absence of a clear hierarchy between the productivity distributions of the other categories of firms in trade and in other service activities may reflect the lower fixed costs associated with international market activity, compared to the costs incurred by manufacturing firms. So it is easier for less productive service firms in these industries to export and import goods.

3. Developments in employment between 1997 and 2005

International trade and foreign investment are often seen as factors exerting a substantial – and often negative – influence on employment in industrialised countries. FDI may in fact be a way of relocating activities, and is therefore often perceived as being associated with job losses in those countries. The same is true for imports, especially if they are associated with the outsourcing of part of the production activities to low-cost countries. Conversely, exports – which bear witness to a firm's dynamism – are thought to be beneficial for domestic employment.

This section aims to verify whether there are in fact significant differences in terms of employment trends between firms active only on the domestic market and those which, to varying degrees, are also present in international markets.

The analysis is based mainly on an examination of the gross job flows: it considers the gross job creation and destruction separately. The former correspond to the total jobs created by firms which have increased the number of their employees during a given period, while the latter concern job cuts attributable to firms which have reduced their staff over the same period. Unlike an approach based solely on examination of the net changes, this method makes it possible to measure the scale of the job reallocations within each sector and each category of firms. In fact, it is often the case that some firms expand their workforce during a given period while others, though active in the same sector, make staff redundant. However, the scale of this process is likely to vary between firms, as some have a more stable level of employment than others.

(1) Cf. Girma, Kneller and Pisu (2005) for the United Kingdom, Girma, Gorg and Strobl (2004) for Ireland and Arnold and Hussinger (2005) for Germany.

TABLE 4 NET CHANGE IN EMPLOYMENT
(average annual changes between 1997 and 2005, in FTEs)

	Purely domestic firms	Exporters	Importers	Two-way traders	Belgian multinationals	Foreign firms	Total
Manufacturing	-7,645	28	656	2,256	-1,068	-2,173	-7,946
Wholesale and retail trade	-3,048	700	1,018	2,828	1,461	1,829	4,787
Other services	6,152	432	1,911	2,202	-1,140	3,115	12,671
Total for the three industries ..	-4,542	1,160	3,586	7,285	-747	2,771	9,513

Source: NBB.

3.1 Net changes, gross job flows and employment turnover

The statistics set out in Table 4 show the scale of the net changes in employment in the Belgian economy. Altogether, in the three industries considered, net job creations averaged 9,513 FTEs per annum between 1997 and 2005. This figure masks divergent developments, between and within industries, according to firms' involvement in international activities.

In manufacturing, employment declined at an annual rate of 7,946 FTEs between 1997 and 2005. Although this represents only about one-tenth of the sector's jobs, this decline is due mainly to firms focusing solely on the domestic market. Belgian multinationals and subsidiaries of foreign firms also contributed to the decline

in industrial employment, cutting their workforce by 1,068 and 2,173 FTEs respectively per annum. However, this decline was attenuated by importers and to a greater extent by two-way traders, since their workforce expanded by 656 and 2,256 FTEs per annum respectively. In the case of exporters, net changes in jobs were relatively small.

In the trade sector, employment grew by 4,787 FTEs per annum. All categories of firms contributed to this increase, except purely domestic firms, whose workforce contracted by 3,048 FTEs per annum. Other service activities recorded the largest expansion in employment, at an average of 12,671 FTEs per annum. In this sector, only Belgian multinationals reduced their workforce. However, that is due mainly to job cuts in a very small number of firms active in transport and communication.

TABLE 5 GROSS JOB FLOWS
(average annual changes between 1997 and 2005, in FTEs)

	Gross job creation (1)	Gross job destruction (2)	Net changes (1) - (2)	Turnover (1) + (2)
Manufacturing	27,666	35,611	-7,946	63,277
of which: firm demography ⁽¹⁾	4,675	2,516	2,159	7,191
Wholesale and retail trade	28,487	23,700	4,787	52,187
of which: firm demography ⁽¹⁾	3,949	1,554	2,395	5,503
Other services	57,793	45,122	12,671	102,915
of which: firm demography ⁽¹⁾	8,740	3,757	4,983	12,497
Total for the three industries	113,946	104,433	9,513	218,378
of which: firm demography ⁽¹⁾	17,364	7,827	9,537	25,191

Source: NBB.

(1) Gross job creation in new firms and gross job destruction in firms terminating their activities respectively.

Net changes look relatively modest compared with the gross job flows recorded at the firm level. These are ten times higher than the net figure, with annual creation in the order of 113,946 FTEs and destruction of around 104,433 FTEs. Measured as the sum of gross creation and destruction, employment turnover thus came to 218,378 FTEs per annum. This is due largely to job reallocations in services other than those relating to trade, this branch being admittedly the principal source of job creation. It is also worth noting that each category of firms records job creation and job destruction simultaneously, even though the creation outweighs the destruction for some, while the opposite is true for others. In each sector, the major part of the employment turnover can be attributed to purely domestic firms (cf. infra).

A detailed examination of the job creation and destruction also permits an appraisal of the impact on employment of business start-ups and closures. Between 1997 and 2005, the emergence of new firms led to the creation of 17,364 FTEs per annum, or 15 p.c. of the total gross job creation. The disappearance of firms led to the destruction of 7,827 FTEs, or 7 p.c. of the total gross job destruction. These proportions do not vary significantly between industries. However, most of the jobs created following the establishment of new companies are concentrated in purely domestic firms, where they accounted for 23 p.c. of gross job creation. In fact, most new businesses do not engage in trade with foreign partners when they first start operating.

3.2 Rate of job creation and job losses

The impact international trade and direct investment have on employment is easier to assess by calculating rates of gross job creation and destruction for each category of firms. The method developed by Davis and Haltiwanger (1992)⁽¹⁾ is used for that purpose. Chart 3 shows the

(1) For each firm, the employment growth rate is calculated by means of the

formula: $g_{i,t} = \frac{e_{i,t} - e_{i,t-1}}{n_{i,t}}$, in which $e_{i,t}$ represents the number of workers

employed by firm i in year t and $n_{i,t} = (e_{i,t} + e_{i,t-1})/2$. This method of calculation offers the advantage of limiting the rates of growth to 2 in the case of new firms starting up and -2 in the case of firms closing down. The low growth rates remain close to those obtained by the traditional method. The rates of job creation and destruction specific to a group of firms are calculated on the basis of the averages of the individual positive and negative growth rates, weighted according to each firm's share in the total number of jobs. The respective formulas used to calculate the average rates of gross job creation and destruction are:

$$\text{Gross job creation}_{i,t} = \sum_i \frac{n_{i,t}}{N_t} g_{i,t} \quad \text{for all } g_{i,t} > 0$$

$$\text{Gross job destruction}_{i,t} = \sum_i \frac{n_{i,t}}{N_t} |g_{i,t}| \quad \text{for all } g_{i,t} < 0$$

where $N_t = \sum_i (e_{i,t} + e_{i,t-1})/2$ corresponds to the total jobs in the group of firms in question.

(2) It should be noted that the job cuts in this category of firms were also accompanied by a reduction in self-employed activity – which the database used here does not cover – in the same sector. According to the national accounts, this decline came to around 2.5 p.c. per annum over the period 1997-2005.

average annual rates of gross job creation and destruction calculated at the level of the firms over the 1997-2005 period for the various categories of firms.

In general, the gross job creation and destruction rates display the same tendencies in terms of net changes in employment as those already described. Thus, in manufacturing, the gross job destruction outweighs the gross job creation in most categories of firms, the centre of the circle representing them usually being situated below the diagonal. The net destruction, which can be estimated approximately by the difference between the job destruction rate and the job creation rate, was more pronounced in firms not engaging in any form of international activity. On the other hand, gross job creation exceeded the gross job destruction among importers and, to a lesser extent, among two-way traders. The data therefore suggest that imports of intermediate goods by manufacturing firms contribute to their development, and hence to the creation of new jobs.

In the service activities, almost all categories of firms created more jobs than they destroyed. Among the various types of firms in wholesale and retail trade, only the purely domestic ones – which represent the largest percentage of employment in the sector – reduced the number of their employees.⁽²⁾ In other words, involvement in foreign trade in goods and the establishment of foreign subsidiaries also favour the development of this type of activity.

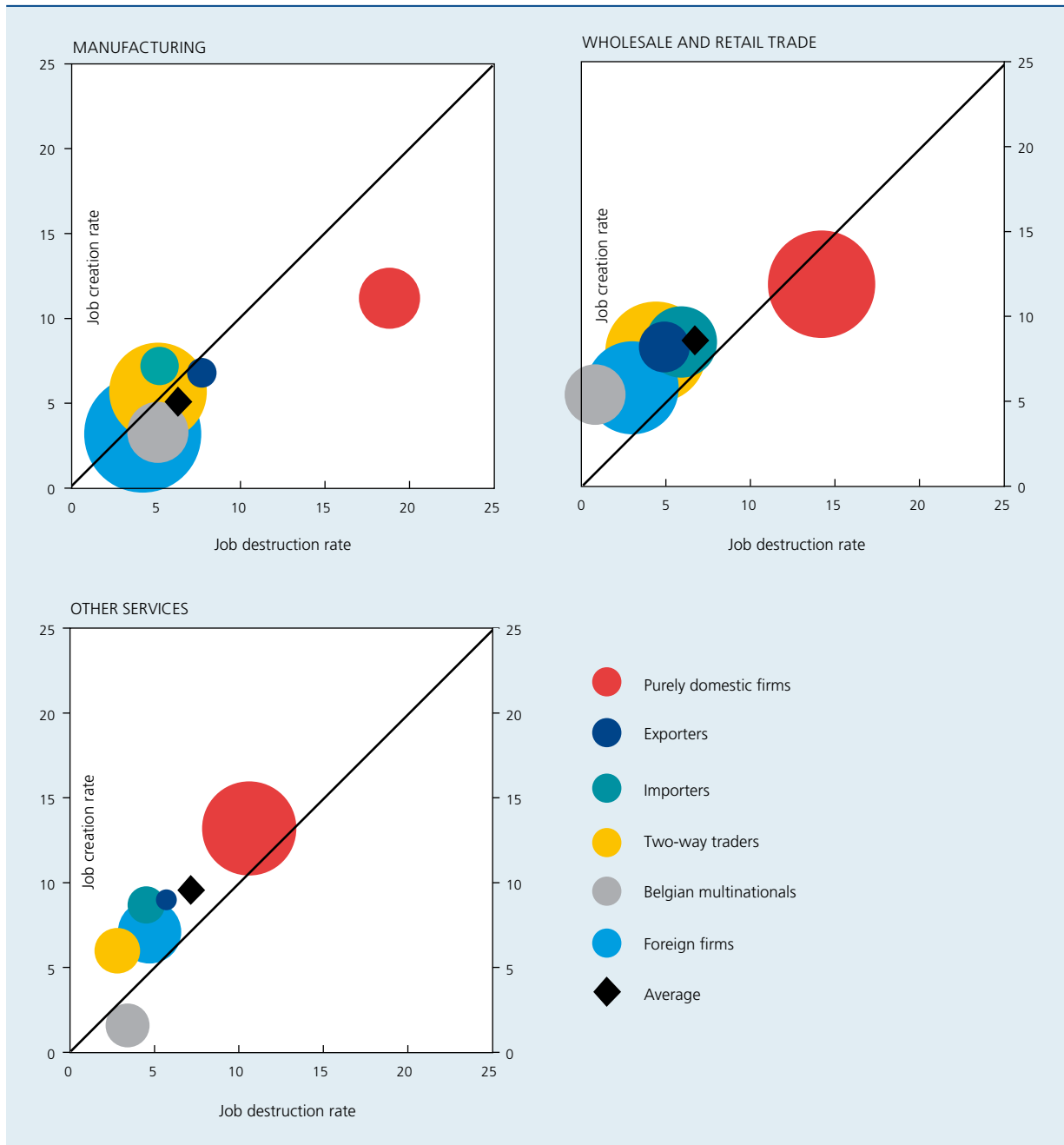
The distinction between firms which are involved in international trade and those which are not is less relevant in the case of other service firms. In contrast to what is seen in the trade sector, there is also no significant difference in terms of net changes in employment between the former and the latter, as gross job creation usually outweighs gross job destruction. The sole exception concerns Belgian multinationals, which reduced their workforce overall between 1997 and 2005. As previously mentioned, it is however important to note that these job losses concern only a small number of large firms, and are concentrated mainly in transport and communication services; moreover, Belgian multinationals represent a relatively small proportion of total employment in service activities.

To sum up, in the sectors concerned with international trade in goods, namely manufacturing industry and distribution, exports and – to a greater extent – imports therefore seem to be associated with more favourable trends in terms of employment. This result partly mirrors the findings of a study by Coucke and Sleuwaegen (2006) based on data relating to Belgian manufacturing firms. Those authors show that firms using foreign suppliers have a greater chance of survival. The link between the

CHART 3

GROSS JOB CREATION AND DESTRUCTION

(averages of the annual percentage changes between 1997 and 2005)



Source : NBB.

Notes: The size of the circle is in proportion to the number of FTEs in each group of firms. The diamonds indicate the intersections between the average job creation and job destruction rates in each sector, taking all categories of firms together. The diagonals represent all the points where job creation equals the job destruction.

trend in employment and direct investment appears more ambiguous, as it varies between sectors.

Looking at the charts, while the position of the circles in relation to the diagonal reflects the net change in employment, the distance from the origin represents the size of the gross flows. The differences between purely domestic

firms and other types of firms are much more marked in this regard. In each of the three industries, the job creation and job destruction rates are much higher in purely domestic firms, which implies that these firms have a higher rate of employment turnover than firms belonging to the other categories. In addition, staff turnover declines as involvement in international trade increases. Thus, in

both manufacturing and trade, two-way traders have lower turnover rates than firms which are purely exporters or purely importers. Similarly, foreign firms and Belgian multinationals generally have lower rates of turnover than other types of firms.

The greater volatility of employment in firms focusing solely on the Belgian market may cause greater uncertainty regarding the security of employees' jobs. International trade, and to a greater extent foreign direct investment, tend to reduce that uncertainty. The lower employment turnover in firms active at international level suggests that being present simultaneously on different markets helps to limit the risks firms face. In the case of exporters, that means that stronger sales growth on foreign markets can compensate for a possible weakness of local demand. This concept of risk diversification also applies to importers, which can use the intermediate goods produced by a foreign-based subcontractor as substitutes for those available from local suppliers, in order to cope with possible price increases or a shortage of inputs supplied locally. Multinationals are the ones with the greatest scope for diversification. In fact, they are generally present on a larger number of markets than exporters who have no subsidiaries outside their country of origin.

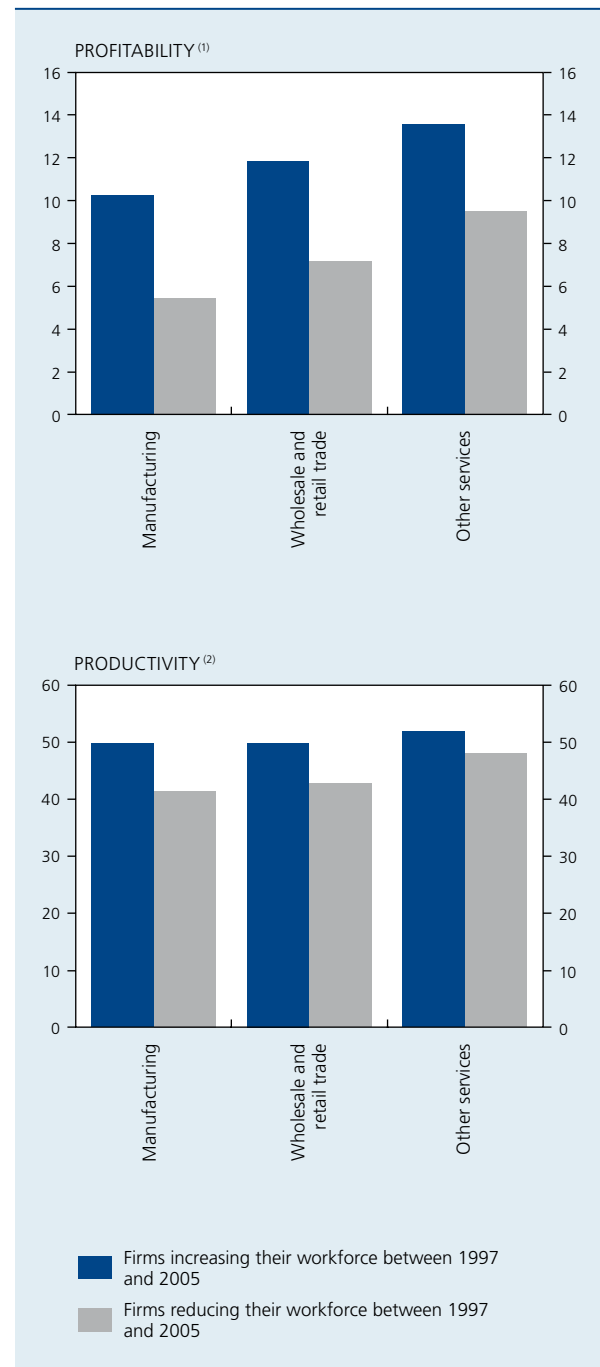
4. Econometric analysis

The results of the descriptive analysis presented in the previous section highlighted employment trends which differ according to the degree of internationalisation of the firms. However, job creation and job destruction can obviously be affected by factors other than foreign trade and FDI.

Those factors may be connected in particular with the economic environment, which depends, for example, on the business situation in the industry where firms operate, as some of them have better development prospects than others. The way in which a firm adjusts its workforce also depends very much on its own characteristics, such as its level of profitability. Thus, the most profitable firms are more likely to have financial resources available to expand and create new jobs while the least profitable firms usually have to curtail their activities or even cease operating, thus generating job losses. The same applies to firms' ability to compete and the efficiency with which they organise their production chain, as the most productive firms have more promising profitability prospects.

The data bear out these assertions, as the firms which increased their number of employees between 1997 and 2005 generally have higher levels of profitability and

CHART 4 LINK BETWEEN EVOLUTION IN EMPLOYMENT, PROFITABILITY AND PRODUCTIVITY
(median values)



Source : NBB.

(1) Measured by the ratio between net profits after taxes and equity capital.

(2) Measured on the basis of value added per full-time equivalent employee and expressed in thousands of euro.

productivity than the firms which reduced their workforce over the same period. However, the link is more pronounced with regard to profitability.

Another characteristic which may be linked to the divergences in employment trends between different firms is the firm's size, as this often reflects its stage of development. As a general rule, large firms are often older and more firmly anchored in their markets than those just starting up. Their growth prospects are therefore less uncertain, so that they can offer their staff greater job security. Firms starting up in business tend to expand their workforce faster in their initial years of operation, if they succeed in securing a foothold in a market. Conversely, they destroy proportionately more jobs if they fail.

By controlling for the effects of these various factors, the econometric analysis provides a more reliable assessment of the impact of foreign trade and FDI on changes in employment. The approach followed here consists in using the ordinary least squares method to estimate a series of equations linking changes in employment in each firm to the firm's degree of involvement in the international markets, and to the other factors mentioned above. The equation for the employment growth rate in an individual firm, designated by the index "i", is therefore specified as follows:

$$g_{i,t} = \alpha + \beta \text{type}_{i,t} + \gamma \text{size}_{i,t} + \delta \text{profitability}_{i,t} + \eta \text{productivity}_{i,t} + \theta \text{industry}_i + t + \varepsilon_{i,t}$$

where $g_{i,t}$ represents the rate of employment growth in the firm in year t , calculated using the Davis and Haltiwanger method.

The results for the various categories of firms covered by the variable "type", namely exporters, importers, two-way traders, Belgian multinationals and subsidiaries of foreign firms, are expressed as the difference in the growth rate in relation to the category comprising purely domestic firms, which acts as the benchmark.

With regard to the other explanatory variables, "size" is measured on the basis of the number of employees, profitability is measured by the ratio between the net profits after taxes and the equity capital. Productivity is defined as the value added per worker. Finally, the variable "industry", which constitutes a set of binary variables for each industry in the NACE 4-digit nomenclature, and the time dummy "t" were included among the explanatory variables in order to control for the sectoral and cyclical effects.

This equation was estimated both for the net employment growth rate and for the gross job creation and destruction rates. The objective is to permit better identification of the channels through which international trade and FDI influence employment. The results of the estimates produced

for each of the three sectors considered are presented in Table 6. In order to verify their robustness, the same estimates were produced on the basis of a sample excluding business start-ups and closures.

The econometric results generally confirm those of the descriptive analysis. In most cases, after controlling for the effects of other factors, firms active on foreign markets record net employment growth which is significantly greater than that of purely domestic firms. In other words, a firm's participation in foreign trade in goods and/or direct investment is in fact usually associated with stronger expansion in the number of its employees.

Taking account of business start-ups and closures, the results obtained for manufacturing indicate stronger employment growth among importers, with an annual rate of change in the number of employees 5.9 percentage points higher than the figure for purely domestic firms. This difference is also very substantial for two-way traders, whose employment growth differential is 5.2 percentage points. It is smaller in firms which only export, as their employment growth is only 1.9 percentage points higher than in purely domestic firms. The fact that an industrial firm owns foreign subsidiaries or is itself wholly or partly owned by a foreign company is also associated with stronger employment growth. This means, in particular, that the establishment of foreign subsidiaries by Belgian manufacturing firms does not generally damage the preservation of jobs in Belgium but, on the contrary, tends to speed up the expansion of firms' activities.

The amount of additional employment market growth associated with international trade and FDI is less marked in service activities than in manufacturing, but remains greater in importers, whether or not they engage in export as well. In the trade sector, it is not significant for Belgian multinationals and subsidiaries of foreign firms, i.e. the latter expand their workforce at the same rate as purely domestic firms. In other service activities, their growth rate is actually lower.

The estimates of the separate equations for gross job creation and destruction also confirm one of the findings of the descriptive analysis, namely that firms active on the international markets exhibit lower employment volatility than purely domestic firms, in both manufacturing and services. In fact, the coefficients relating to the various types of firms indicate that those with trade or direct investment links with other countries have, on average, much smaller job creation and job destruction rates than purely domestic firms, leaving aside the size effect. In manufacturing and trade, that effect is more marked for Belgian multinationals and branches of foreign

TABLE 6 IMPACT OF INTERNATIONAL ACTIVITIES ON JOB CREATION AND JOB DESTRUCTION

(ordinary least squares estimates over the period 1998-2005; coefficients expressed as percentage points)

	Results including business start-ups and closures			Results excluding business start-ups and closures		
	Net job creation	Gross job creation	Gross job destruction	Net job creation	Gross job creation	Gross job destruction
Manufacturing						
Exporters	1.9	-6.9	-14.0	6.7	-0.8	-15.7
Importers	5.9	-5.2	-17.5	9.9	-	-18.8
Two-way traders	5.2	-6.8	-19.6	9.7	-0.8	-21.4
Belgian multinationals	4.2	-10.0	-23.0	8.2	-4.1	-23.4
Foreign firms	2.6	-12.4	-23.8	7.5	-5.0	-24.6
Wholesale and retail trade						
Exporters	1.7	-7.4	-13.5	7.0	-0.9	-15.4
Importers	3.1	-6.6	-16.4	8.3	-	-17.8
Two-way traders	2.4	-7.5	-16.9	8.4	-	-19.6
Belgian multinationals	-	-10.1	-16.6	3.7	-4.0	-18.1
Foreign firms	-	-10.2	-19.0	4.9	-2.8	-19.9
Other services						
Exporters	-	-7.0	-11.5	5.3	-	-12.3
Importers	2.5	-4.8	-10.2	7.2	1.4	-11.4
Two-way traders	1.6	-6.5	-11.7	7.4	1.0	-13.2
Belgian multinationals	-4.7	-11.4	-12.2	-	-2.9	-9.4
Foreign firms	-5.4	-10.0	-9.5	-1.2	-4.0	-9.6

Notes: The figures in this table are to be interpreted in terms of the difference in relation to purely local firms. The dashes indicate coefficients whose value is not significantly different from zero at the 5 p.c. level, i.e. the cases where the impact on employment of the type of international activity concerned is not significantly different from that of a purely domestic activity. For the sake of brevity, the coefficients relating to the firms' size, profitability and productivity and those relating to effects specific to each industry and time effects are not reported.

firms, where employment turnover is consequently lower. The econometric results also show that the positive influence of foreign trade and FDI on employment operates more through a reduction in job losses – the effect being more apparent on gross job destruction – than through an increase in job creation.

The results are slightly different if business start-ups and closures are excluded. Compared to the findings on the basis of the sample including them, the most striking differences concern the coefficients of the equations relating to the rates of net and gross job creation, which are higher. In fact, as most new businesses are concentrated in the category of purely domestic firms, the main effect of excluding job flows due to the demography of firms is to reduce the employment turnover rates for that category. As a corollary, in relation to that benchmark, the results for the other categories of firms are higher.

Despite these quantitative differences, the conclusions concerning the effects of foreign trade and FDI on employment in firms remain the same. The findings of stronger employment growth and lower employment turnover in internationally active firms can therefore be considered robust to entries and exits of firms.

Conclusion

Traditionally, the role of foreign trade in the operation of the economy is examined by a macroeconomic approach. It concerns in particular the global position of the economy as regards international openness, competitiveness or export performance. As in other fields of economic research, a microeconomic approach evidently strengthens the foundation of that analysis by taking account of the diversity of firms' individual situations.

The results presented here for Belgium broadly confirm those available for other countries. By merging the Central Balance Sheet Office data with the foreign trade figures and the data from the direct investment survey, they are based on a very large – or virtually exhaustive – sample of non-financial corporations, whereas other studies tend to concern large firms in manufacturing industry.

The results show that only a relatively small proportion of firms established in Belgium are involved in international trade. An even smaller percentage of those belong to multinational groups. However, these firms are notable for their higher level of productivity and larger size than firms focusing solely on the domestic market.

Even after controlling for the effects of other factors, such as the industry, the general business situation or the firm's size, it is evident that firms having trade or direct investment links with other countries exhibit stronger employment growth. This difference is more particularly pronounced in the case of importers, whether they operate in manufacturing or in the trade sector. Thus, importers have attenuated somewhat the decline in employment in the Belgian manufacturing sector. This suggests that the use of international outsourcing enables firms to move to the production of higher value added products for which they have greater competitive advantages. However, it must be emphasised that the results relating

to job creation or job destruction set out in this article may present divergent trends for different skill levels in the workforce. International outsourcing, such as the establishment of foreign production units, may in fact increase the demand for highly skilled labour to the detriment of less skilled workers.

This study also reveals a robust link between the international activities of Belgian firms and a lower rate of employment turnover. On average, multinationals and firms active in foreign trade exhibit lower job creation and job destruction rates than firms focusing solely on domestic markets. This lower employment volatility is attributable to the scope for diversification available to firms present on foreign markets in addition to their domestic market. As a result of that diversification, both foreign trade and direct investment provide employees with more stable jobs.

In all, the results therefore indicate that firms participating in the trend towards globalisation obtain better results than those ignoring it. However, the initial costs associated with international openness require them to have first attained an adequate level of productivity. To foster foreign expansion and hence to anchor activities and employment in the economy, firms and governments should therefore endeavour both to augment productivity and to reduce the barriers to foreign trade.

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