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When Multinationals Leave: A CGE Analysis of the Impact of Divestments

Antonio G. Gómez-Plana and María C. Latorre

Abstract
Most studies on Multinational Enterprises (MNEs) focus on the impact of their expansion through inward or outward foreign direct investment (FDI) flows. However, divestments are quite common among the operations of MNEs. In order to derive their effects, we have built a computable general equilibrium (CGE) model that includes two non-standard characteristics: the presence of MNEs, further extended to include unemployment. The model is applied to the Spanish economy, where FDI inflows have surpassed divestments at the aggregate level in the period 2005-2009. However, in ten sectors divestments are sizeable. Therefore, we analyse two different scenarios: 1) Divestments that imply the closure of plants of foreign affiliates; and 2) Divestments in which national firms buy the plant of the foreign affiliate. The model allows estimating the overall impact of the divestments occurring simultaneously in the ten sectors. We further, analyse the contrasting impact of divestments depending on the particular sector in which they take place. Results not only show that national acquisitions are less harmful than closures, but quantify those effects, and provide information on the divested-sector role. In any case, some adjustment costs arise in all scenarios.

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Keywords FDI, disinvestments, closures, national acquisitions, Spain

Authors
Antonio G. Gómez-Plana, Department of Economics, Universidad Pública de Navarra, Pamplona, Spain
María C. Latorre, ✉ Department of Applied Economics II, Universidad Complutense de Madrid, Spain, mmunozla@ucm.es

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1. Introduction

Most studies on Multinational Enterprises (MNEs) focus on the impact of their expansion through inward or outward foreign direct investment (FDI) flows, and foreign outsourcing or offshoring. Barba Navaretti and Venables (2004) and Feenstra (2010) present a review of their theoretical and empirical effects on host and home countries. However, divestments are common operations of MNEs: "[They] *affect between one quarter and four fifths of all FDI projects*" (UNCTAD, 2009, p. 8). This phenomenon becomes more important in times of crisis and high unemployment (UNCTAD, 2012, p. 62-63), but is not limited to those times. Bernard and Jensen (2007) point to the abundance of plants shutdowns across manufacturing firms in the U.S, of which MNEs account for around one fifth of the subsequent employment destruction. Ibarra-Caton (2012) has recently found that U.S. manufacturing plants of foreign MNEs are more likely to shut down than non-MNE plants (although less likely to shut down than U.S. owned MNEs' plants). It seems, thus, that divestments are an important side of the operations of MNEs for which evidence is scant in the specialised literature.

Boddewyn (1983) suggests that a divestment can be treated as the reverse process of FDI under certain circumstances. When the advantages of internalization or location cease for EMNs, the inexistence of barriers to exit may favour divestments. This transitory nature of FDI in advanced economies could well explain divestments as long as the emerging and transition economies become more attractive for MNEs (e.g., because of lower labour costs, EU membership). In 2010, developing and transition economies have attracted half of the worldwide FDI inflows (UNCTAD, 2011). The UNCTAD itself regards this as a record figure, since these countries used to receive around one third of world FDI inflows. China explains most of this trend because it is the top destiny of FDI flows. But in 2010, there were already ten developing or transition economies among the top 20 recipients of inward FDI. In contrast, developed economies have undergone divestment processes, particularly Japan and some European countries (UNCTAD, 2011 and 2012). What are the consequences of these processes?

As stated by Barba Navaretti and Venables (2004), there is not clear evidence on the hypothesis of a relationship between MNEs divestment and employment volatility. There may be two reasons why employment could have a different degree of volatility in MNEs than in national firms. The first is that MNEs have a different degree of exposure to international shocks than have national firms. MNEs are more sensitive to technology and price shocks, which would shift their downward-sloping labour demand schedules. The second is that, by being organized to operate several plants, MNEs have lower costs of relocation than national firms (e.g., when a change in the home wage rate takes place, the elasticity of labour demand can be higher for MNEs than for national firms). The theoretical effect of MNEs on employment volatility is ambiguous and depends on several factors: complementarity or substitutability relationship between employment in the host country and factors of production in other locations, commitment with local institutions, labour and product elasticities of demand and production factor intensities, etc. Nevertheless, the empirical evidence shows that when a demand shock takes place, MNEs adjust their employment more rapidly than national firms, although they are more likely to preserve their employees (see, for example, Görg and Strobl, 2003; Barba Navaretti *et al*., 2003).

The lack of a clear theoretical framework to model divestment makes it suitable for simulation models to test plausible scenarios. For this reason in this study, we analyse the case of Spain, a developed economy that has been heavily affected by the financial crisis and experienced a huge increase in unemployment rate (from 8% in 2007 to 25% in 2012). Total FDI net inward flows have been positive in Spain (i.e., the entry of FDI surpasses FDI divestments). However, in some sectors divestments have been bigger than the entry of FDI flows. We use a simulation model, a computable general equilibrium (CGE) model, which allows us to follow the differential impact of divestments depending on the sector in which they occur. We also estimate the effects of all simultaneous divestments for the economy as a whole. This CGE model is one of the few that accounts for the operations of MNEs. It is further augmented to include unemployment, a feature that to the best of our knowledge has still not been included in any of the CGEs with MNEs (see Latorre, 2009, for a review). Unemployment effects seem crucial for the analysis of divestments. We further have developed a social accounting matrix (SAM) for the Spanish economy for the year 2005. This database has been completed with FDI and MNEs Spanish data.

The present paper is organised as follows. The next section offers some worldwide evidence on the recent trends of the operations of MNEs. Section 3 focuses in the description of the divestments that have taken place in Spain from 2005 onwards. Section 4, explains the CGE model with multinationals while section 5 offers the main results. Section 6 presents a sensitivity analysis. The conclusions appear in the last section.

2. Worldwide evidence on MNEs employment

OECD (2012a) provides data on the MNEs employment across a group of OECD member countries. A comparison, which takes into account the breaks in the series, is summarised in Table 1. The data refers to the activities of MNEs in all manufacturing sectors (data on the primary sector and services are poorer). The first two columns offer the number of employees in MNEs in 2001 and 2007. The third column gives the percentage variation of the number of employees between those two years. Countries have been ordered in the table according to this percentage variation. At the top are the countries that have experienced important increases in the number of employees. Most Eastern European countries are in this group. However, there are advanced economies as well, such as Denmark, Switzerland and Austria.

A second group of countries experience more modest increases in the number of employees. Finally, at the bottom of the table there are countries in which MNEs reduced employment. Reductions are sizeable for some countries (Ireland, The Netherlands, Norway, Italy, United States and France). One hypothesis is that these losses in employment could be due to technological progress. However, advances in technology tend to be, somehow, available for different countries when they take place within a MNE. But these data show that some countries lose employment while others increase it. It seems that other factors must be at play (e.g., cost savings, EU membership) when deciding to hire or not to hire more workers in a particular country. For example, the relative expensive low-skilled manufacturing employees in advanced

countries have decreased in number and a plausible explanation is the offshoring process to emerging economies (see, for example, Feenstra (2010) and Yamashita (2010), for a description of the USA and Japan cases). The effect of investment creation and diversion when the transition economies enter the EU seems also plausible according to Table 1: new EU entrants as Poland, Czech Republic, Slovak Republic, Hungary or Slovenia increase MNEs' employees whereas former EU members as Netherlands, Italy, France, UK, Spain or Portugal decrease it. Baldwin *et al.* (1996) and Bajo-Rubio and López-Pueyo (2002), for example, examine this kind of relationship between FDI and economic integration.

The evolution in the number of employees in MNEs can be compared with the same variable in national firms. This is shown in the next three columns in Table 1. They display the share of employees in MNEs with respect to total employees in manufacturing. All the countries that increase the number of employees in MNEs, also experience an increase in their share of MNEs. This implies that MNEs create more employment than national firms.

There are different trends among the countries that reduce employment in MNEs. On the one hand, Ireland, Norway, Italy, France display a decrease in the share of MNEs in total number of employees. On the other hand, The Netherlands, the U.S., United Kingdom, Sweden and Portugal increase the share of MNEs in employment.

These changes in employment suggest that MNEs can be playing a key role in employment creation or destruction in OECD countries, with a different performance for national firms and MNEs. We focus on the case of Spain, where aggregate employment creation has been sizable before the crisis. The Spanish Economically Active Population Survey accounts a 29.1% growth in employees and self-employed for the period 2001-2007 for the whole economy.

3. Divestments in the Spanish Economy

Spain has been for decades an attractive country for the activities of MNEs (Bajo-Rubio and López-Pueyo, 2002). But as explained in the introduction, FDI projects, sooner or later, are affected by divestments. Myro *et al.* (2008) provide a wide overview of divestment processes in manufactures in Spain.

MNEs account for an important share in production in manufacturing: around 16% of their employees according to Table 1. This is also the case in services, with a 7% in production in 2005 that has risen to nearly 10% in 2009 (INE, 2012a; Eurostat, 2012; OECD, 2012b). Spain experienced an important boom in FDI inflows before joining the European Community in 1986. Spain also became an important source of FDI outward flows (Guillén, 2005, Guillén and García-Canal, 2010), with world leading MNEs in services (Santander, BBVA, Telefónica...), infrastructure (Grupo Ferrovial, ACS...), energy (Repsol, Iberdrola), clothing (Zara, Mango)...etc. According to the World Investment Report, Spain has been in the top 10 largest sources and recipients of FDI of the world in the last years.

The Spanish Registry of FDI (Ministry of Economy and Competitiveness, 2012) offers a dataset to analyse the evolution of inward (and outward) FDI. This source allows estimating divestment flows. A caveat on divestments data is how to avoid including operations that are not strictly related to reductions in production or employment. For example, this is the case for reverse intra-company loans, or the repayments of debts to parents. These cases appear in many sources as a divestment, but the Spanish Registry of FDI data allows disentangling them from the sectoral data on transmissions to other owners (e.g., a national acquisition of a foreign plants), and from partial and total closures. Unfortunately, this information is usually not available at the sectoral level in other institutions such as the OECD, UNCTAD, Eurostat...etc.

A related issue is how to measure the level of the foreign capital stock or "net FDI position" data. The series on FDI from the Spanish Registry of FDI consider the equity capital component at sectoral level. This contrasts with the information from other institutions, such as the Bank of Spain, Eurostat and the OECD that do not allow extracting the equity capital component at sectoral level. In this study, we concentrate on divestments proxied by the impact of reductions in the equity capital (excluding reinvested earnings and other capital).We take as reference to our model the FDI position in 2005, to be coherent with the rest of the dataset (see section 4.8).

Table 2 summarises the calculations of the variations in the net FDI position. First of all, it should be stressed that the net FDI position for the whole economy (labelled in row "TOTAL" in Table 2) increases by 35.57% in the period 2005-2009 (latest year for which it is available). In the pre-crisis period (2005-2007) the growth of the foreign capital is of 12.85%. Thus, the Spanish economy as a whole has been attracting foreign capital. However, in some sectors, divestments prevail over the FDI inflows received. As a consequence, the net FDI position falls in them. The sizes of the decreases are important and, according to Table 2, they had appeared before the crisis (with the exception of "Textiles" and "Activities auxiliary to financial intermediation"). However, in six out of the ten sectors considered, the crisis exacerbated divestments.

Table 2 only includes the sectors where divestment takes place. It gathers all the divestments that have occurred in the Spanish economy at sectoral level, except for two small sectors, one in the Primary sector and the other in Other manufacturing. Due to the small size of these two latter sectors, we did not expect to find important effects for the economy as a whole. Thus, our simulations will cover the effects arising from the sectors included in Table 2.

In order to simulate divestments we need to consider some additional information. The World Investment Report (UNCTAD, 2009) reports that between one-fourth and one-third of all cross-border mergers and acquisitions consist of the disposal of foreign affiliates to other firms. The buyer may be a firm based (1) in the economy previously hosting the affiliate, (2) in the home economy or (3) in a third country. Note that case 1 results in a reduction of the net FDI position in the host economy (i.e., a divestment), whereas cases 2 and 3 do not have any implication for the net FDI position (i.e., they are not registered as divestments).

According to the World Investment Report, in most cases a firm based in the host economy buys the affiliate. Next more common case is the purchase from a firm based in a third country, and the less frequent case is a purchase from a firm based in the

MNE's home economy. If a national firm buys the plant of a foreign affiliate, the plant would continue its operations under a different ownership but, usually, experiencing a reduction in employment. In the other extreme, divestments may imply the closure of plants of foreign affiliates, leading to more drastic employment outcomes. In our study, we analyse these two types of divestments across different sectors of the economy of Spain.

The Spanish Registry of FDI offers the data on the relative importance of divestments of MNEs, which imply the closure of firms versus those divestments that ended up in the acquisition of the foreign affiliate by a national firm. There is no public information at the sectoral level, but only for the economy as a whole. Table 3 shows that closures account for a smaller part of divestments (the weighted average for the period 2005-2011 is 20.3%), while national acquisitions account for the rest. In our study, we will simulate the impact of both, closures and national acquisitions. This will offer us the two extreme hypotheses between which the impact of divestments must be. Nevertheless, it seems that the effect will tend to be closer to the outcomes derived from national acquisitions.

4. The Model and simulations

The model is a wide extension of Gómez-Plana and Pascual (2011). It adds MNEs differentiated from national firms, and also includes FDI changes. It is a static computable general equilibrium model describing an open economy, disaggregated in 23 productive sectors (see Appendix), one representative consumer, the public sector and a foreign sector representing the rest of the world. The extension of the model is addressed to: (1) Split each productive sector in two: one part represents the firms owned by residents, and the other part includes foreign owned firms. (2) Characterize the capital uses according specific factor assumptions. (3) Define the sectors in order to follow the adjustment that will take place after the divestments. (4) Exogenize the public sector policies to focus on effects generated by the private sector.

It must be noted that due to the high unemployment rate in the Spanish economy, instead of using the common assumption of full employment in labour market, the model includes unemployment in a way derived from trade unions models. Next we present a brief description of the model. The model core equations are in Gómez-Plana and Pascual (2011), and the full set of equations can be requested to authors.

4. 1. Equilibrium conditions

The equilibrium of the model is a set of prices and an allocation of goods and factors. It involves the simultaneous solution of three sets of equations:

- Zero-profit conditions.
- Market clearing in goods and capital markets.
- Constraints on disposable income (total revenue must equal total expenditure), labour market (includes unemployment) and macroeconomic closure of the model.

4. 2. Production

Production is based on a technology characterized by a nested structure of intermediate inputs, capital and labour. The firms' problem is to maximise profits subject to the technology constraints, obtaining the unit cost functions, which are further used in the zero-profit conditions. In turn, the demand for factors and intermediate inputs are obtained from Shepard's lemma on cost functions, and then used in the market-clearing equations.

Firms show constant returns to scale in their technologies and fix a competitive pricing rule, with free entry and exit of firms. However, note that within each sector there are two different varieties of the same good: a national variety produced by national firms and a foreign one produced by MNEs. The price of the two different varieties can differ because their costs of production vary between national firms and MNEs of the same sector. Thus, we abandon the usual assumption of equal costs of production for national firms and MNEs across sectors, which is present in most of the CGEs including MNEs (see Latorre, 2009 and 2010). This equal costs assumption arises because only the percentage of capital owned by MNEs is used to split the sectors into a national firms' part and another MNEs' part. Thus, the input mix is the same between both types of firms within the same sector. By contrast, in our model, we split sectors in two parts using Eurostat's information on the shares of production, labour and capital that MNEs and national firms own (see section 4.8). As a result, the costs structure differs between national firms and MNEs in each sector.

To put in perspective our way of modelling MNEs' technologies, a comment on recent CGEs with MNEs seems in order. Jensen and Tarr (2012) extend their important contributions (Jensen, Rutherford and Tarr, 2007; Rutherford and Tarr, 2008) to consider a multi-regional framework. All their models include a Dixit-Stiglitz-Ethier mechanism in imperfectly competitive sectors which leads to potential increases in both contributions (Jensen, Rutherford and Tarr, 2007; Rutherford and Tarr, 2008) to consider a multi-regional framework. All their models include a Dixit-Stiglitz-Ethier mechanism in imperfectly competitive sectors which leads to potential increases in both consumers' welfare and producers' productivity through a higher number of product varieties. The idea is the possibility of obtaining a quality adjusted unit of services at a reduced price when there are more varieties (i.e., more firms producing those services, due to the arrival of MNEs). However, in the models of Jensen, Rutherford and Tarr, MNEs do only compete with national firms in the provision of intermediates. They extend the approach of Markusen et al. (2005) and focus on the role of MNEs in services sectors as suppliers of intermediates.

Lakatos and Fukui (2012) have built a multiregional CGE model with MNEs. An interesting feature is their effort to construct an ambitious database on foreign affiliates' sales for the whole world with rich sectoral detail (Fukui and Lakatos, 2012)[1]. The differentiation of the technologies of MNEs and national firms within each sector in the CGE is based on the MNEs' shares in sales (and not in their shares in production as in our model, which may be a worth noticing nuance to grasp well-tuned differences in productivity) and in a proxy for differences in capital labour ratios for the two type of

[1] In our view, the main contribution of this database is that it provides information for the sales of MNEs in many countries and sectors for which formerly there was no information at all.

firms. But in the study of Lakatos and Fukui (2012) there is no difference in the value added provided by both type of firms (which is assumed to be proportional to sales, while we introduce the real shares on value added components and not a ratio), so that they introduce a further degree of symmetry between both national firms and MNEs.

These recent CGE approaches seem to transmit the idea that one may well face a trade-off between expanding the regional coverage of the model and being precise with the differential technologies of national firms and MNEs across sectors. Further, the models we have just commented in the two previous paragraphs capture the impact of MNEs by relying on barriers to FDI in order to make FDI movements endogenous. Those barriers are difficult to be estimated empirically. By contrast, in our model, we get the real data on the variations of the FDI net position across sectors and derive their impact.

4. 3. Consumption

There is a representative consumer household behaving as a rational consumer. The level of consumer's welfare is determined by the endowments of capital and labour jointly with exogenous net transfers paid by the public sector. The fixed endowment of labour should be interpreted as a maximum supply of labour since leisure and unemployment are assumed to be endogenous. Hence, labour supply would be elastic up to the endowment constraint.

The household's decisions problem consists of choosing an optimal consumption bundle, by maximizing a nested utility function subject to the budget constraint. Preferences are represented by a nested utility function on (consumption of) goods, leisure and savings. Notice that, given our static approach, we consider a unit elasticity of substitution between savings and (consumption of) goods (Howe, 1975), so that savings can be interpreted as the purchase of bonds for future consumption.

The budget constraint includes total factor rents jointly with exogenous net transfers paid by the public sector. Demand functions for goods, leisure and savings are derived from the first-order conditions, and are included in the goods and factor markets equations, as well as in the macroeconomic closure for savings.

4. 4. Public sector

The role of the public sector in the model is twofold, i.e., owner of resources (e.g. from capital endowment and tax revenue), and purchaser of certain goods. As a resources owner, its wealth includes income from capital rents, net transfers paid to the representative household, and tax revenues. Taxes consist of social contributions paid by employers and employees, value added taxes, other net indirect taxes, and income taxes. All taxes are modelled as effective *ad valorem* rates calibrated from benchmark data, except for income taxes that are exogenous. In order to isolate any bias from the public sector on results, *ad valorem* indirect tax rates are allowed to change endogenously under the equal yield assumption.

Capital rents for the public sector, by definition (see Eurostat, 1996), include the fixed

capital consumption because net operating surplus is zero for the public sector. The fixed capital consumption has been assigned to two sectors: "Public services" and "Other services". All the capital in "Public services" is owned by the public sector, whereas in "Other services" a share is publicly owned and other share is private.

The public sector also enters the model as a purchaser. Public sector expenditure includes both market (i.e., output that is disposed of in the market at economically significant prices) and non-market goods (i.e., output that is provided at prices that are not economically significant).

4. 5. Foreign sector

The model incorporates the small open economy assumption. It means that the country faces a perfectly elastic export supply function. There is also a constant elasticity of transformation function between domestic and foreign sales. Regarding imports, we assume that goods are differentiated according to their origin (i.e., domestic or foreign), following Armington's assumption (Armington, 1969), which allows for the possibility of intra-industry trade despite the assumption of exogenous world prices.

The foreign sector is closed by assuming that the difference between receipts and payments from the rest of the world is exogenous. This constraint would avoid, e.g., a permanent increase in exports with no change in imports, an unlikely scenario since it would involve an unlimited capital outflow from the country. Nevertheless it forces a matching movement in trade flows.

4. 6. Factor markets

Two factors enter into the model: capital and labour. With respect to capital, both the representative household and the public sector own fixed endowments. The capital rents adjust to clear the domestic capital market, under the assumptions of capital international immobility (except for the divestments, which have been modelled as exogenously driven), and no mobility across domestic sectors. Hence the capital is specific in two levels: (1) Each sector employs only specific capital, and (2) capital is differentiated in relation to the owner (i.e., public, private national and foreign).

The only owner of labour is the representative household. The demand for leisure is derived from the household's optimization problem. Hence, labour supply (i.e., the labour endowment less the demand for leisure) would be elastic up to the fixed amount of labour. Labour is assumed to be international immobile, but mobile within the country.

We assume that labour owners (i.e., workers) have some market power and their wages requests are related to unemployment level in the economy (Kehoe et al., 1995). For that reason the model includes the following constraint:

$$w = \left(\frac{1-u}{1-\bar{u}} \right)^{1/\beta}$$

where w represents real wages, u is the unemployment rate, $\bar{u}$ is the unemployment rate

in the benchmark, and β is a parameter that measures the real wage flexibility with respect to the unemployment rate. Hence, when β approaches infinity, the real wage approaches its benchmark value (which is 1 according to the calibration process explained below). This is the case for rigid real wages when wages do not change when unemployment does. If β approaches zero, the unemployment rate approaches the benchmark unemployment rate, with real wages being flexible. Intermediate values for β show different flexibility levels of real wages to the unemployment rate.

4. 7. Macroeconomic closure

Total investment is split into sectoral gross capital formation using a fixed-coefficients Leontief structure (Dervis *et al.*, 1981). Notice that, in our static framework, total gross capital formation shows its influence on the economy as a component of final demand. The model embodies a macroeconomic closure equation stating that investment and savings (private, public and foreign) are equal.

Finally, the model is solved as explained in Rutherford (1999), with the general equilibrium model defined as a mixed complementarity problem (see Mathiesen, 1985). The software employed is GAMS/MPSGE.

4. 8. Calibration and data

The model has been calibrated with Spanish data. The calibration method is based on a benchmark equilibrium corresponding to the National Accounts and a set of exogenous parameters. A detailed explanation for the calibration method can be found in Mansur and Whalley (1984) and Dawkins *et al.* (2001).

To build the Social Accounting Matrix (SAM) we depart from the last Input-Output symmetric table disposable for the Spanish economy: year 2005. In order to do so we further use the institutional sectors accounts from the Spanish Instituto Nacional de Estadística (INE, 2012b). Public revenue data has been disaggregated for indirect taxation, as social security contributions. The sector disaggregation in the SAM includes[2] first the ten sectors that register divestments (see Table 2). Another set of sectors has been chosen for their upstream and downstream linkages with the ten disinvesting sectors. And there are two other aggregate sectors (Other industry and Other services), which blend the remaining sectors.

Elasticities play a key role in the model (see sensitivity analysis in section 6). The benchmark values for those elasticities are:
• Elasticities of substitution in the welfare function:
— between consumption and savings (σCA): 1
— between final consumption and leisure (σCO): 1
— among final consumption goods (σBC): 1
• Elasticities related to production:
— between intermediate inputs and value added composite (σI): 0
— between labour and capital (σLK): values fluctuate between 0.20 and 1.68
— between domestic and foreign goods (Armington elasticities): values fluctuate between 1.25 and 4.05

[2] The Input-Output table has 72 sectors that have been aggregated into 23 sectors. See Appendix.

— between goods sold in the domestic market and abroad (elasticities of transformation): values fluctuate between 0.70 and 3.90

The literature sources for the elasticities are Narayanan and Walmsley (2008) for σLK and σA; the elasticities of transformation from De Melo and Tarr (1992); and σCO is consistent with the survey by Ballard and Kang (2003). The remaining values are common in the literature.

Sectoral data (on production, employment and factor rents) is split between national firms and MNEs. Most of the information for those shares comes from Eurostat (2012) with few exceptions. Data of Financial sector comes from Banco de España (2006a) and Asociación Española de Banca (2006). For Construction there is no data for 2005, so we use data for 2008, which is the first available year in Eurostat (2012). Data for Agriculture comes from SABI (2012) database.

4. 9. Simulations

Two broad types of simulations are run. On the one hand, some simulations look at the impact of divestments, which imply the closure of the foreign firms ("Closure" hypothesis). The closure (total and partial) is represented as a decrease in sectoral capital stock owned by foreigners in Spain.

On the other hand, other simulations look at the effects of the acquisition of the foreign plant by national firms ("National acquisition" hypothesis). The sales to national firms involve the change in property and the capital moves from foreign to national firms. As explained in section 3, national acquisitions are more common and account for approximately 80% of the divestments. However, we do not know the distribution of closures and national acquisitions at the sectoral level. Therefore, we will simulate the two extreme scenarios to know the range in which results should be. The values of divestments analysed are the ones for the period 2005-2009 (see Table 2).

For the "National acquisition" scenario one question arises in a general equilibrium framework: How did Spanish firms finance the purchase of the foreign affiliates? To the best of our knowledge, there is not exact information on this issue. We know, however, that since 2003 most Spanish MNEs that acquired other firms abroad did it through loans (Banco de España, 2011). In those years credit was easily available at very low interest rates. INE (2012b) data shows that non-financial firms became increasingly indebted from 2003 to 2007, while the pace of indebtedness was reduced but still present in 2008-9. Further, the Bank of Spain (2006b) and the European Central Bank (2006) confirm that for that period much of the demand for credit was related to mergers, acquisitions and firms' restructuring. It seems reasonable, therefore, to assume that national firms were given loans in order to purchase the foreign affiliates located in Spain. This is taken into account in the simulations.

5. Results

The scenarios "Closure" and "National acquisition" are presented for two cases: (i) Joint impact of the simultaneous divestments in the ten sectors where divestment takes place. It is labelled "All divestments" for both scenarios (section 5.1). (ii) The general

equilibrium effects of divestment in one sector. This is done for each of the ten sectors where divestment takes place (section 5.2). Both cases reproduce the divestments *really* experienced in Spain between 2005 and 2009. Due to the static character of our model, the results should be viewed as the short-medium run outcomes.

5.1. The impact of the simultaneous divestments in all divesting sectors

Figure 1 summarises the main findings for our two extreme hypotheses ("Closure" and "National acquisition"). With respect to "Closure", foreign capital leaves the country for good and workers in foreign affiliates are dismissed. Around 1.5% of the total employment in the economy is destroyed. The unemployment rate rises by 11% (i.e., from its level in 2005, 9.16%, to 10.16%). Since labour demand lowers, the real wage in the economy goes down (wages are the same for all workers due to the assumption of full mobility of labour across sectors). The lower labour demand (and employment) also involves a lower capital demand. This lower capital demand jointly with the fall in capital supply (i.e., of the amount of divestment) generates a small fall in the remuneration of capital than that of the wage: -0.13% (rental rate of capital is a sectoral weighted average, given the capital specific assumption).

The fall in the factors employed in production and their lower remunerations result in a decrease of both GDP and welfare (measured as Hicksian equivalent variations) of -1.45% and -1.70%, respectively. Since the level of activity diminishes due to the closure of plants, foreign trade diminishes as well.

Next we analyse the scenario where all the former foreign plants end up in the hands of national firms ("National acquisition"). Under this hypothesis, the unemployment rate will decrease by -3.55% (turning from 9.16% to 8.83%). Total employment in the economy rises by 1%. Capital is now used in national firms, whose technology is slightly more labour intensive in aggregate than the ones in the MNEs (see Figure 2 for sectoral detail). The general increase in labour intensity generates a Stolper-Samuelson-theorem effect on factor rents: an increase in wages with respect to capital rents. The real rental rate of capital goes down by -1.55%, while wages grow 0.24%. However, the positive effects for employment in the economy do not push GDP up. It remains nearly at the same level (-0.03%), due to capital rent fall.

Welfare decreases under this "National acquisition" hypothesis. The representative household has a decrease in the remuneration of capital. Therefore, the pronounced fall in the rental rate of capital is harmful for the consumer. Foreign trade diminishes when national employers, compared to the case in which MNEs were the owners, undertake more firms. Logically, the fall in trade is smaller than in the scenario "Closures".

5.2. Sectoral differences in the impact of divestments

We analyse the effects of divestments for each sector in turn. Recall that disinvesting sectors are the ones from Table 2. The results of these simulations appear in Table 4 ("Closure" hypothesis) and Table 5 ("National acquisition" hypothesis).

5.2.1. Sectoral Closures

The sectoral analysis helps to identify the different magnitudes of the outcomes of the shock according to the sector in which it takes place. We also check whether all sectors follow the trend described above in the "all divestments" simulations. Note that the last row in Table 4 offers the results of Figure 1 for the sake of comparison. The variables are the ones considered in the previous section.

The biggest reductions in employment take place after the closure of plants in "Motor vehicles, trailers and semi-trailers" (Motor vehicles, henceforth) and in "Telecommunications", with reductions of -0.46% and -0.36% in total economy employment, respectively. The most sizeable increases in the unemployment rate take place after the shock in the same two sectors. However, there is a fall in the rental rate of capital in Telecommunications (-0.12%), while it increases for Motor vehicles (0.14%) (note that Telecommunications is more capital intensive, Figure 2). This implies that the fall in GDP and welfare are the biggest after the closures in Telecommunications (-0.41% and -0,43%, respectively). Next more harmful effects arise after closures in Motor vehicles (-0.35% in GDP, and -0,42% in welfare). The fall in foreign trade is biggest after the shock in this latter sector, characterised by the international openness of its activities.

Although differing in magnitudes, all sectors follow the trend described earlier when analysing the "Closure" hypothesis in "all divesments". Only "Activities auxiliary to financial intermediation" have different outcomes for employment, unemployment and wages. This is related to the fact that the amount of labour affected in the shock in this sector is much smaller than the one affected after the shock in the rest of sectors. It becomes easier to reallocate a smaller quantity of labour throughout the economy, so adjustment costs are lower.

In general, the differences in the magnitude of the impact of closures across sectors are related to the amount of capital involved in the shock. This is a combination of the weight of MNEs in the capital stock of the sector, as well as, how labour intensive they are, together with the magnitude of the decrease in the net FDI position.

5.2.2. National acquisitions across sectors

Telecommunications is also the sector in which the harmful effects for GDP are the biggest when national acquisitions take place (Table 5). We indeed still get a fall in GDP, although smaller than in the case of closures (now it is -0.27% versus the previous -0.41%). In fact, national acquisitions in most sectors result in small GDP decreases. After Telecommunications next biggest falls arise for "Other business activities" and Motor vehicles. In most cases, the national acquisitions increase employment and wages and reduce unemployment. This trend should be familiar, since we observe it in the "all divesments" ("National acquisition" hypothesis), displayed in the last row of Table 5. However it is the fall in the real rental rate of capital, which brings about the bad results in GDP. Note that with the national acquisitions the remuneration of capital falls by more than in the case of closures (as reported in Table 4). In the case of "closures" capital becomes less abundant in the country, while with national acquisitions the total stock of capital remains fixed (although there is a change in ownership). These forces

imply that capital will be relatively more expensive when it becomes less abundant (i.e., "closure" case). Further, the reduction in the rental rate of capital after national acquisitions in the short run is supported by empirical evidence. Anand et al. (2005) derived that firms experience difficulties in their post-acquisition performance, further stressing that wider geographic scope in post-acquisition would be helpful. Note that the "national acquisition" case would commonly reduce the geographic scope of the activities of the firm, compared to the previous case where the plant was part of an MNE. Hennart (2009, p. 1445) also explains that there is a cost in managing integration, which provides a rationale for the national acquisition losses.

For manufacturing sectors the higher level of activities in national firms implies that the fall in foreign trade is smaller than in the case of closures. However, for services when more activities are undertaken in national firms the fall in foreign trade is bigger than for the case of closures. More activities in national firms in services contracts foreign trade.

National acquisitions in Motor vehicles exhibit a different pattern because it is relatively labour intensive. The same phenomenon (i.e., MNEs being even more labour intensive than national firms) takes place in "Other Business". However, this latter sector accounts for an important part of consumption and, thus, follows simultaneously the demand side of the economy. Thus, costs are not so important for the evolution of this sector. The evolution of costs is also important for the evolution in "Sale and repair of motor vehicles" and, to a lesser extent, "Renting of machinery and equipment". MNEs in the former sector are very capital intensive with respect to national firms. When foreign capital leaves, capital enters into the national part of it and generates a boom in employment in that national part, which comes together with a decrease in unemployment. "Sale and repair of motor vehicles" is the only sector in which national acquisitions bring about a GDP increase. In agreement with previous results derived from the arrival of MNEs (Latorre et al., 2009, Latorre, 2013), these sectoral differences in the impact of "National acquisition" imply that cost structures are important to explain the outcomes.

6. Sensitivity Analysis

A sensitivity analysis on model elasticities for all scenarios has been performed. Table 6 displays the results for a selected group of macroeconomic variables focused on labour market effects: employment, unemployment rate and wages. These variables can be considered a good example of the sensitivity of the results to the whole set of elasticities. The results are referred to scenario "All divestments" for the two types of changes in capital stock: "National acquisitions" and "Closures". The full set of results for the rest of microeconomic and macroeconomic variables and scenarios has been omitted here and can be requested to authors.

The sensitivity analysis focuses on the elasticities related to the welfare and production functions. In the first line in Table 6 is displayed the base scenario "All divestments" for "National acquisitions" and "Closures". The benchmark elasticities have been duplicated and halved.

With respect to "National acquisitions", the shocks in the elasticity of substitution between aggregate consumption and savings hardly affect the results. The change in the

elasticity of substitution between consumption and leisure affects the labour supply and, logically, this is reflected in the employment, unemployment rate and wages. A higher (lower) elasticity of substitution consumption-leisure exacerbates (dampens) the changes in those variables. Changes are in quantitative terms, but not in signs. The elasticity of substitution among consumption goods has a small effect on labour market variables. Finally, the elasticity of substitution capital-labour affects the capital and labour demands. Nevertheless, the labour market variables are not significantly affected.

The "Closures" simulations follow a similar pattern to the previous "National acquisitions" case. Although signs with respect to the base case are maintained in all the cases displayed in Table 6, it shows a lightly higher effect in quantitative terms. It can be explained because of the fall in capital endowments. With a smaller amount of capital, effects on the other factor (labour) should be stronger.

Concluding Remarks

The FDI inflows received in the Spanish economy prevail over the amount of total divestments (i.e., reductions in the net FDI inward position) in the period 2005-2009. However, in some particular sectors, MNEs' divestments have surpassed their investments.

In this paper, we first work on the data available to estimate the magnitude of sectoral divestments trying to isolate those that imply a reduction in production and employment in MNEs. We find these to be sizeable in some Spanish sectors. In order to analyse the effects of these divestments we develop a CGE model which considers the presence of MNEs and, simultaneously, unemployment. As far as we know, there is not any other research with a CGE model with unemployment and MNEs. Thus, we estimate the economy-wide impact of divestments, offering results for total employment, the rate of unemployment, real wages, capital remunerations, GDP, welfare and foreign trade.

Fortunately for the Spanish economy, foreign divestments not always resulted in the closure of plants but in the acquisition of foreign plants by national firms. The World Investment Report published by UNCTAD reports that this predominance of national acquisitions is a general trend across countries. We pay close attention to this matter by estimating two different hypotheses ("Closure" versus "National acquisitions"). The real outcome should be between these two extreme cases.

Taking into account all simultaneous divestments in the ten sectors where they have concentrated between 2005 and 2009, we obtain the following main outcomes for the short-medium run. For "Closures", the unemployment rate would increase from 9,16% (its 2005 level) to 10.16%, and GDP would decrease by -1.45%. In the case of "National acquisitions", the unemployment rate would be reduced from 9.16% to 8.83%, and GDP would remain approximately at its initial level. This suggests that "closures" would only have accounted for a very small share of the huge increase in unemployment that Spain has recently experienced (from 8.4% in 2005 to 24.6% in 2012), even though they could have been more important to explain the fall in GDP in 2009 (-3.7) or 2010 (-0.3%).

We also analyse the differential impact of divestments according to the sector in which they have taken place. The shocks are asymmetric insofar as they simulate the magnitudes of the divestments that took place in the period 2005-2009 in each of the sectors in turn. We analyse the impact in both manufactures and services sectors. In the "Closure" scenario divestments in "Telecommunications" and "Motor vehicles" would bring about the most substantial increases in the unemployment rate and in GDP reductions. For "National acquisition" the greatest reductions in unemployment would stem from "Sale and repair of motor vehicles", "Renting of machinery and equipment", "Activities auxiliary to financial intermediation" and "Air and water transport". Regarding GDP outcomes (in the "National acquisition" case) only "Sale and repair of motor vehicles" yields an increase in GDP, while for the rest of ten sectors GDP would be slightly reduced. For most sectors, the different outcomes of divestments are related to the contrasting cost structures of MNEs across sectors.

It could be expected a priori that national acquisitions of foreign MNEs would be good for the host economy. Our results point out that this is the case in terms of unemployment reductions and employment creation. However, due to the impact of national acquisitions on capital remuneration (i.e., on firms' profits), it turns out that welfare diminishes in the host economy. Additionally, GDP could also go down in some cases.

The disperse sectoral divestments experienced recently in the Spanish economy do clearly have a considerable negative effect for the Spanish economy when they take the form of closures. They also have some harmful effects (welfare and GDP reductions) as well as positive outcomes on employment creation and unemployment reduction in the case of national acquisitions.

This paper provides detailed quantitative estimations of the processes related to divestments that could be helpful in order to implement some policy options.

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Table 1. MNEs and employees in manufacturing sectors (2001-2007)

	No employees in MNEs			*Share of MNEs in Manufacturing*			*% difference No. Employees 2001-7*	
	2001	**2007**	**% 2001-7**	**2001**	**2007**	**DIF 2001-7**	**National firms**	**Total economy**
Sizeable Increases								
Poland	386003	658021	70,5	21,9	32,5	10,6	**-0,72**	14,87
Czech Republic	362423	564543	55,8	28,9	45,5	16,6	**-24,16**	**-1,06**
Denmark	65800	83006	26,1	14,1	22,6	8,5	**-29,08**	**-21,30**
Slovak Republic*	143482	180019	25,5	34,9	43,8	8,9	**-13,70**	**-0,03**
Hungary*	230402	287296	24,7	27,1	36,9	9,8	**-20,73**	**-8,42**
Switzerland*	119025	145345	22,1	11,6	13,6	2	1,80	4,15
Estonia*	41078	49333	20,1	38,4	45	6,6	**-8,50**	2,48
Slovenia*	37129	42977	15,8	15,9	18,7	2,8	**-4,86**	**-1,58**
Austria*	n.a.	179141	n.a.	24	29,1	5,1		
Small increases								
Germany*	1086000	1144000	5,3	14,8	16,5	1,7	**-7,40**	**-5,51**
Luxembourg*	13800	14400	4,3	41,7	44,3	2,6	**-6,16**	**-1,78**
Israel	44412	46402	4,5	n.a.	n.a.	1,6		4,48
Belgium*	n.a.	n.a.	n.a.	32,3	34,8	2,5		
Finland	73450	74169	1,0	17,2	19,2	2	**-11,72**	**-9,54**
Decreases								
Ireland	123186	102439	-16,8	49,2	46	-3,2	**-5,45**	**-11,06**
Netherlands*	210116	176445	-16,0	21	24,3	3,3	**-30,46**	**-27,43**
Norway	70388	60944	-13,4	24,3	22,4	-1,9	**-3,72**	**-6,07**
Italy	520749	456987	-12,2	10,8	10,1	-0,7	**-5,43**	**-6,16**
United States*	2330200	2050700	-12,0	11,1	11,3	0,2	**-13,75**	**-13,55**
France*	1043400	938151	-10,1	26,4	26,1	-0,3	**-8,68**	**-9,05**
Spain	408579	386041	-5,5	16,4	16,1	-0,3	**-3,41**	**-3,76**
United Kingdom	906237	859110	-5,2	24	30,4	6,4	**-31,46**	**-25,16**
Sweden	232579	221744	-4,7	32,7	33,4	0,7	**-7,63**	**-6,66**
Portugal*	108366	108046	-0,3	12,8	13,3	0,5	**-4,59**	**-4,04**

Source: OECD (2012)

Table 2. Changes in the net FDI position in Spain

	2005-7%	2005-9%
Beverages & Tobacco	-61,46	-36,46
Textiles	27,25	-28,39
Fabricated metal products	-5,62	-4,90
Motor vehicles, trailers & semi-trailers	-4,86	-22,51
Sale & repair of motor vehicles	-14,99	-25,87
Air and water transport	-15,36	-32,65
Telecommunications	-18,98	-36,11
Activities auxiliary to financial intermediation	0,95	-3,49
Renting of machinery & equipment	-34,37	-48,97
Other business activities	-22,21	-17,40
TOTAL	12,85	35,57

Source: The Spanish Registry of FDI (Ministry of Economy and Competitiviness, 2012)

Table 3. Closures and national acquisitions in divestments in Spain

	2005	2006	2007	2008	2009	2010	2011	Average
Percentages								
Closures	27,4	9,8	10,1	20,6	35,0	31,2	7,9	20,3
Total closure	5,5	1,0	5,7	8,0	5,5	7,1	3,6	5,2
Partial closure	21,9	8,8	4,4	12,6	29,5	24,1	4,3	15,1
National acquisitions	72,6	90,2	89,9	79,4	65,0	68,8	92,1	79,7
Total	100	100	100	100	100	100	100	100,0
Millions of euros								
Closures	1790	990	1031	776	738	896	131	907
Total closure	358	105	585	301	116	204	60	247
Partial closure	1432	885	446	475	622	692	71	660
National acquisitions	4753	9095	9183	2989	1368	1980	1520	4413
Total	6543	10085	10214	3765	2106	2876	1651	5320

Source: The Spanish Registry of FDI (Ministry of Economy and Competitiviness, 2012)

Table 4: Simulations results: effects of "Closures" across sectors

	Employment	Unemployment	Wage	Rental rate of capital	GDP	Welfare	Imports	Exports
Beverages & Tobacco	**-0,17**	1,22	**-0,08**	**-0,06**	**-0,12**	**-0,18**	**-0,20**	**-0,20**
Textiles	**-0,02**	0,14	**-0,01**	0,00	**-0,02**	**-0,02**	**-0,01**	**-0,01**
Fabricated metal products	**0,00**	0,02	**0,00**	0,00	**0,00**	**-0,01**	**0,00**	**0,00**
Motor vehicles, trailers & semi-trailers	**-0,46**	2,96	**-0,20**	0,14	**-0,35**	**-0,42**	**-1,96**	**-1,96**
Sale & repair of motor vehicles	**-0,16**	1,41	**-0,09**	**-0,07**	**-0,23**	**-0,25**	**-0,45**	**-0,45**
Air and water transport	**-0,01**	0,22	**-0,01**	**-0,06**	**-0,05**	**-0,11**	**-0,10**	**-0,10**
Telecommunications	**-0,36**	2,85	**-0,19**	**-0,12**	**-0,41**	**-0,43**	**-0,51**	**-0,51**
Activities auxiliary to financial intermediation	0,06	**-0,17**	0,01	**-0,12**	**-0,02**	**-0,15**	**-0,14**	**-0,14**
Renting of machinery & equipment	**-0,13**	1,34	**-0,09**	**-0,13**	**-0,23**	**-0,39**	**-0,25**	**-0,25**
Other business activities	**-0,11**	0,94	**-0,06**	**-0,08**	**-0,14**	**-0,34**	**-0,19**	**-0,19**
All Divestments (closures)	**-1,49**	11,00	**-0,74**	**-0,13**	**-1,45**	**-1,70**	**-3,16**	**-3,16**

Table 5: Simulations results: effects of "National acquisition" across sectors

	Employment	Unemployment	Wage	Rental rate of capital	GDP	Welfare	imports	exports
Beverages & Tobacco	**0,00**	0,11	**-0,01**	**-0,05**	**-0,02**	**-0,03**	**0,00**	**0,00**
Textiles	**0,00**	0,02	**0,00**	**-0,01**	**-0,01**	**-0,01**	**-0,01**	**-0,01**
Fabricated metal products	0,01	**-0,02**	0,00	**-0,01**	**0,00**	**-0,01**	**-0,01**	**-0,01**
Motor vehicles, trailers & semi-trailers	**-0,21**	1,48	**-0,10**	**-0,08**	**-0,19**	**-0,25**	**-1,25**	**-1,25**
Sale & repair of motor vehicles	1,04	**-4,78**	0,32	**-1,04**	0,26	**-0,86**	**-0,35**	**-0,35**
Air and water transport	0,54	**-1,61**	0,11	**-0,99**	**-0,11**	**-1,22**	**-1,08**	**-1,08**
Telecommunications	0,38	**-0,46**	0,03	**-1,06**	**-0,27**	**-1,37**	**-1,28**	**-1,28**
Activities auxiliary to financial intermediation	0,61	**-1,94**	0,13	**-1,05**	**-0,09**	**-1,28**	**-1,13**	**-1,13**
Renting of machinery & equipment	0,71	**-2,39**	0,16	**-1,18**	**-0,07**	**-1,27**	**-1,12**	**-1,12**
Other business activities	0,39	**-0,58**	0,04	**-1,02**	**-0,23**	**-1,48**	**-1,20**	**-1,20**
All divestments (national acquisitions)	1,00	**-3,55**	0,24	**-1,55**	**-0,03**	**-1,40**	**-1,64**	**-1,64**

Table 6: Sensitivity analysis

	National Acquisitions			Closures		
	Employment	Unemployment rate	Wages	Employment	Unemployment rate	Wages
Base: All divestments	1.00	-3.55	0.24	-1.49	11.00	-0.74
Elasticity of substitution between savings and consumption (σCA = 1)						
σ'CA = 2	0.99	-3,60	0,24	-1,50	10,99	-0,74
σ'CA = 0.5	1,00	-3,52	0,24	-1,48	11,00	-0,74
Elasticity of substitution between consumption and leisure (σCO = 1)						
σ'CO = 2	0,89	-6,37	0,43	-1,74	8,08	-0,54
σ'CO = 0.5	1,06	-1,87	0,13	-1,34	12,62	-0,85
Elasticity of substitution among consumption godos (σBC = 1)						
σ'BC = 2	1,09	-3,47	0,23	-1,64	12,25	-0,82
σ'BC = 0.5	1,00	-3,67	0,25	-1,28	9,53	-0,64
Elasticity of substitution between labour and capital (σLK = Narayanan and Walmsley, 2008)						
σ'LK = σLK * 2	0,99	-3,43	0,23	-1,75	12,53	-0,84
σ'LK = σLK * 0.5	1,00	-3,55	0,24	-1,27	9,79	-0,66

Figure 1. Simulations results: effects of all divestments

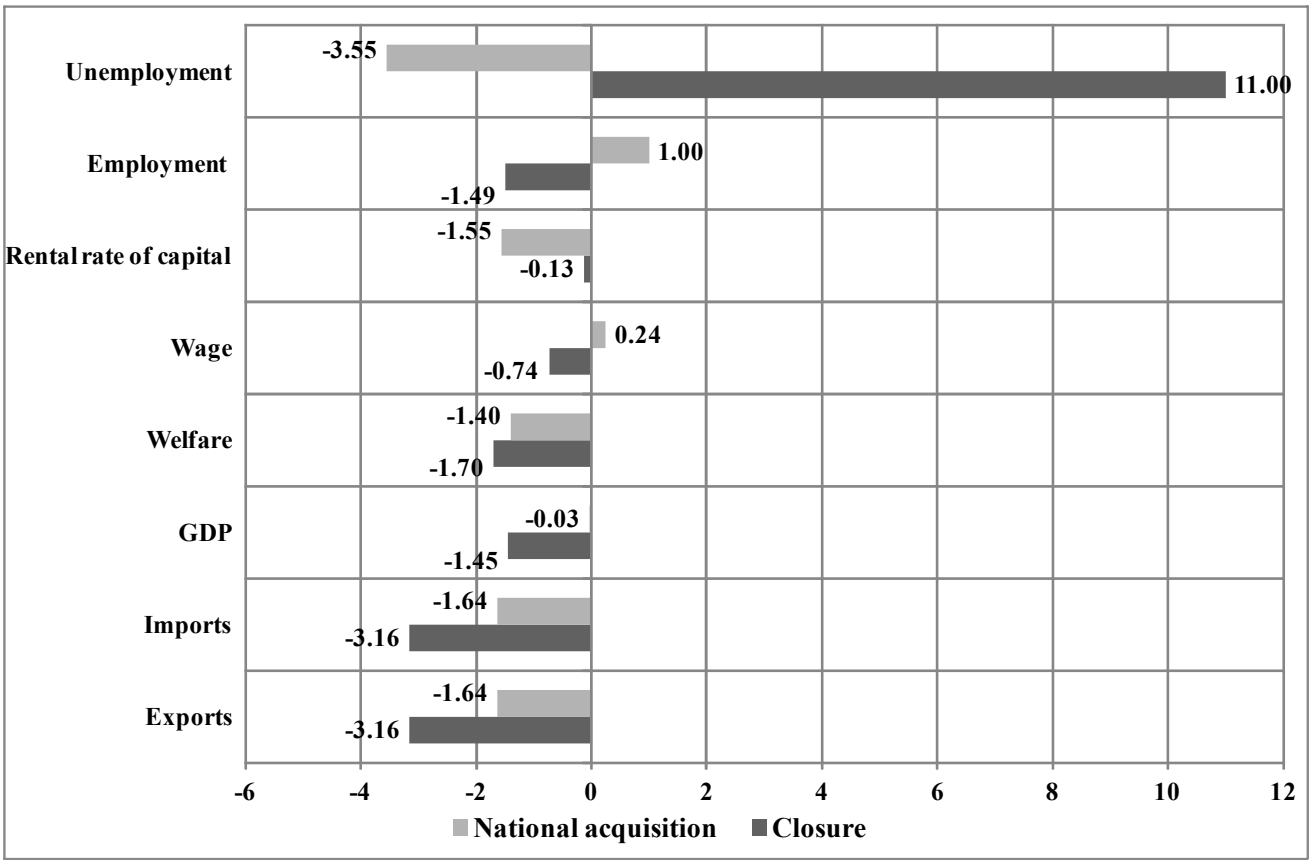
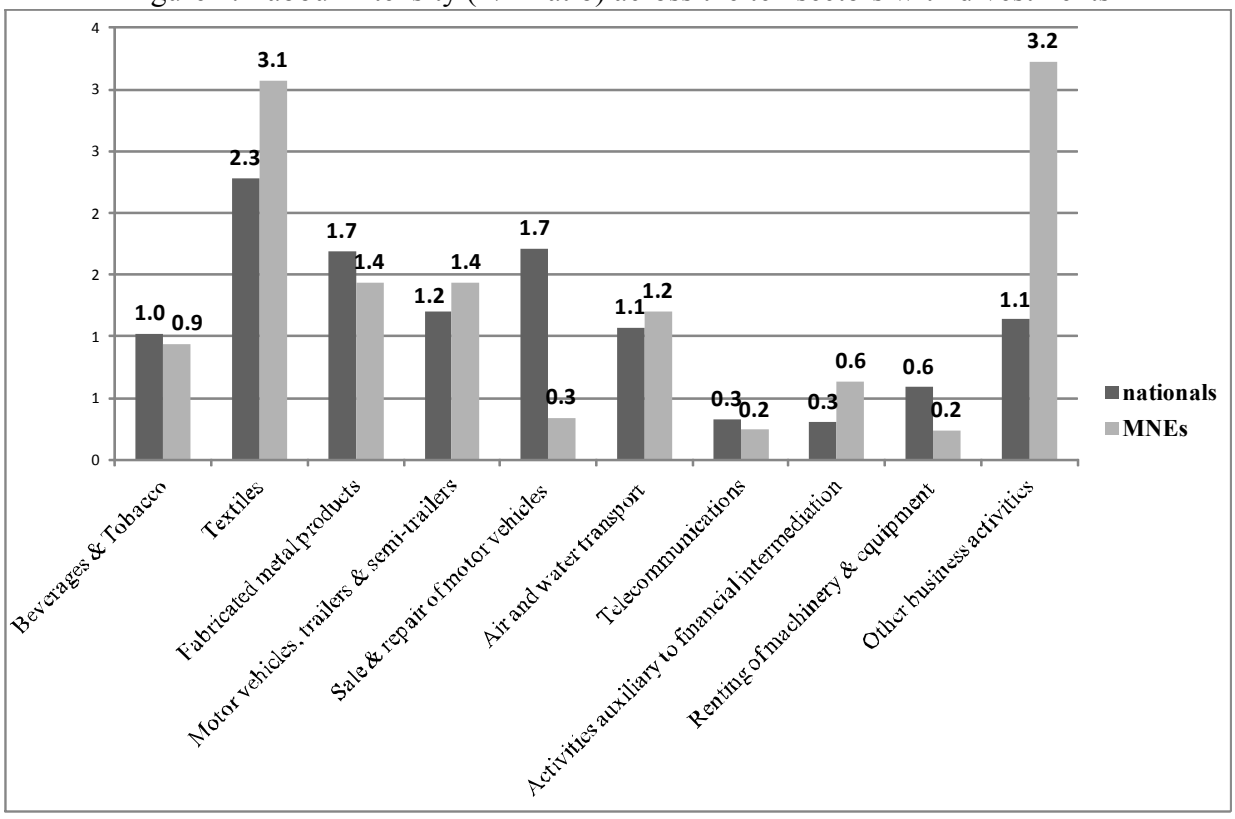


Figure 2. Labour intensity (L/K ratio) across the ten sectors with divestments



APPENDIX:Sectors in the model and their correspondences with different sectoral classifications.

	Spanish Input-output Table (2005)	NACE Rev. 1	Nace Rev.2
Primary goods	**1,2,3**	**01,02,05**	**01,02,03**
Energy	**8,9,10**	**23,04**	**19,35**
Food products	**12,13,14**	**15 (except 159)**	**10**
Beverages & Tobacco	**15,16**	**159,16**	**11,12**
Textiles products	**17,18,19**	**17,18,19**	**13,14,15**
Chemical products	**23,24**	**24,25**	**20,21,22**
Basic metals	**29,31**	**27,29**	**24,28**
Manufacture of metal products	**30**	**28**	**25**
Motor vehicles, trailers & semi-trailers	**36**	**34**	**29,3311,3315,3316,3317**
Other industries	**4,5,6,7,11,20,21,22,25,26,27,28, 32, 33,34,35,37,38,39**	**10,11,12,13,14,41,36,20,21,22, 26,30,31,32,33,25,36,37**	**05,06,07,08,09,36,16,17, 18,23,26,27,30,31**
Contruction	**40**	**45**	**41,42,43**
Sale & repair of motor vehicles and automotive fuel	**41**	**50**	**45**
Wholesale and retail trade	**42,43**	**51,52**	**46,47,95**
Air and water transport	**48,49**	**61,62**	**50,51**
Other transport	**46,47,50,51**	**60,63**	**49,52,79**
Post and telecommunications	**52**	**64**	**53,61**
Financial intermediation	**53,54**	**65,66**	**64,65**
Activities auxiliary to financial intermediation	**55**	**67**	**66**
Real estate activities	**56**	**70**	**68**
Renting of machinery & equipment	**57**	**71**	**77**
Other business activities	**60**	**74**	**69,70,71,73,74,78,80,81,82**
Other services	**44,45,58,59,61,62,63,64,65,66,71,72**	**55,56,72,73,80,85,90,91,92,93**	**55,56,58,62,63,72,85,75,86,87,88, 37,38, 39,94,59,60,90,91,92,93,96**
Public services	**67,68,69,70**	**75,80,85,90**	**84,97**