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MULTINATIONALS IN THE MOTOR VEHICLES INDUSTRY: A GENERAL EQUILIBRIUM ANALYSIS FOR A TRANSITION ECONOMY

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Abstract

In the Post-Communist era many western multinational enterprises (MNEs) have arrived to the Czech Republic. The process has been particularly intense in the Motor vehicles sector. This article analyses the economy wide and sectoral impacts for this host economy by means of a computable general equilibrium (CGE) model. The growth of the capital stock for Motor vehicles MNEs leads to small increases in GDP and welfare. However, after a certain degree of capital accumulation saturation effects arise and GDP and welfare begin to fall. The phenomenon of profit repatriation, which has been substantial since 2004, can considerably exacerbate the negative effect on GDP and welfare.

Keywords: Motor vehicles, multinational enterprises, Computable general equilibrium, Profit repatriation, Czech Republic

JEL Classification: C68, F21, F23

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1. Introduction

In 2007, approximately, one in four automobiles produced in Europe was manufactured in Central and Eastern European (CEE) countries. Some projections indicate that this share will rise to around 31% by 2014 (Pavlínek et al., 2009). Nevertheless, the process is not evenly distributed among countries and the Central European (CE) economies account for most of this manufacturing production. The Czech Republic headed the growth rates in passenger cars production. Between 1989 and 2007, its production rose by +399%, followed by Slovenia (+211%), Ukraine (+145%) and Poland (+144%) (Pavlínek et al., 2009). This transformation in the motor vehicles industry in the CEEs has received some attention in the literature (e.g., Dycker, 2006; Haiss et al., 2009; Jürgens and Krzywdzinski, 2009; Pavlínek, 2003; Pavlínek and Janâk, 2007; Pavlínek, et al., 2009).

The Czech Republic stands out as a destiny of foreign multinational enterprises (MNEs) in the automobile sector. Czechoslovakia, which was subsequently transformed into the Czech Republic and Slovakia in 1993, after the fall of the Berlin Wall in 1989, had Škoda. This firm had been a leading vehicle producer before World War II, but by the 1980s had become obsolete. Nevertheless, it was still able to respond to centrally-planned exports produced with the help of an important network of suppliers located throughout Czechoslovakia. In 1991, the Volkswagen Group took over Škoda. Škoda had an important stock of human capital and Volkswagen expanded its existing capacities considerably in the Czech Republic. Hence, Škoda became one of the four basic brands of the VW Group (VW, Audi, Seat and Škoda). In 2005, the PSA Group jointly with Toyota began the production of small vehicles in the Czech Republic. In September 2009, a new assembly plant of Hyundai was installed in this country.

The arrival of automobile MNEs into this former communist country had a crucial role in the transformation of this sector. Table 1 shows the relevance of the share of MNEs in Motor vehicles for the Czech Republic, and similar conclusions can be derived for other CEE countries such as Hungary, the Slovak Republic and Poland. The high share of the Motor vehicles industry in the whole economy, and the plausibility of linkages among sectors allow formulating the hypothesis of relevant general equilibrium effects. Hence, the aim of this paper is to study the general equilibrium effects in the Czech Republic of the growth in foreign MNEs' capital share in the automobile sector. The role of MNEs in this process and their distinctive performance with respect to domestic counterparts (e.g. technology and profit repatriation) are explicitly studied. For this purpose a computable general equilibrium (CGE) model is designed.

Table 1. MNEs in Motor vehicles industry (shares in percentage)

		2001	2002	2003	2004	2005	2006
Czech Republic	Employment	69.4	68.8	73.3	79.6	81.3	79.9
	VA	84	83.8	86.4	89.4	90.6	89.4
	Production	90.7	88.7	90.4	93	93.3	91.7
Hungary	Employment	n.a.	n.a.	n.a.	68.8	72.7	82.6
	VA	n.a.	n.a.	n.a.	91.5	91.6	94.4
	Production	n.a.	n.a.	n.a.	93.2	93.8	96.2
Slovak Republic	Employment	n.a.	n.a.	n.a.	79.5	n.a.	77.4
	VA	n.a.	n.a.	n.a.	93.8	n.a.	93.6
	Production	n.a.	n.a.	n.a.	97.5	n.a.	96.5
Poland	Employment	60.4	60.7	65.2	69	69.9	71.5
	Turnover	89.7	88.3	88.3	90.8	86.6	86.2

Source: OCDE (several years)
Note: Throughout this article "Motor vehicles" is defined according to ISIC Rev. 3 ("34 Motor vehicles") or NACE 34. It includes parts and accessories for motor vehicles and their engines, together with trailers and semi-trailers, but not "other transport equipment". For the data of the Czech MNEs, non-financial firms with 100 employees or more are surveyed; smaller firms are surveyed by sample. The method for estimating non-responses is different between the time periods 2000-01 and 2002-04. The data refer to majority foreign-owned enterprises, which have a foreign capital share of more than 50%.

The CGE model includes the feasibility of profit repatriation for MNEs' capital owners in the automobile sector. This characteristic of the model has been identified as particularly important to evaluate the impact of MNEs on host economies (Latorre et al., 2009). Note that profit repatriation in Motor vehicles changed outstandingly since 2004, as Table 2 reports.

Table 2. Profit repatriation on total income (in percentage)

	2000	2001	2002	2003	2004	2005	2006	2007
Motor vehicles	1.6	6.1	4.6	6.5	47.0	59.7	15.7	53.7
Manufacturing	42.0	23.2	32.0	34.2	41.7	67.7	29.6	42.0
Czech Economy	53.1	22.1	33.7	46.1	49.2	48.3	56.0	53.1

Source: Czech National Bank (several years)
Note: Profit repatriation is calculated as dividends sent abroad over total earnings of MNEs.

CGE models seem especially suitable to take into account different degrees and forms of territorial embeddings, as they share with the input-output methodology the fact of including intersectoral links in the analysis. Nevertheless, CGE models can use more flexible forms to model links than the fixed coefficient structure of the input-output framework. Therefore, they allow dealing with many economic sectors taking into

account the linkages among them (Dawkins et al., 2001) and “assessing (…) which sectors are better or worse off after a shock” (Shoven and Whalley, 1984). In addition, unlike an input-output analysis, which concentrates mainly on the production side of the economy, a general equilibrium framework takes also into account the demand side.

CGE models can estimate the effects of MNEs on aggregate variables of a host economy. This is done in a consistent and unified framework with the microeconomic side of the adjustment, showing the effects at the sectoral level on other variables such as production, prices, exports, or intermediate inputs. It has been asserted that the potential of CGE models lies in their ability to integrate micro and macro elements (Devarajan and Robinson, 2005). Nevertheless, CGE models including the operations of MNEs are scarce (see Latorre, 2009; for a review). This may be related to the difficulty of introducing MNEs in CGE trade models due mainly to data and other constraints. Thus, this paper deals with data on MNEs at a sectoral level in a general equilibrium framework. To the best of our knowledge, no study has estimated the economy wide impact in a CEE country that automobile MNEs have brought with a general equilibrium approach.

The remaining of the paper includes the following sections. Section 2 describes the main characteristics of the model. Section 3 shows the data and the simulations, while the results are displayed in section 4. Finally, section 5 remarks some concluding comments.

2. The model

Our approach is based on a computable general equilibrium model, which incorporates real data into a theoretical framework. As explained in Shoven and Whalley (1984, 1992), CGEs are based on the Arrow-Debreu general equilibrium model, with some extensions. The interactions among economic agents are presented as a system of equations derived from optimising agents. Their optimal decisions are embedded in a framework representing national accounts identities. The solution to the system of equations is an equilibrium where a set of prices and quantities solve for:

- Zero profits for national and MNEs firms.
- Market clearing for goods and factors (i.e., demands equal supplies).
- Some constraints for macroeconomic closure of the model, disposable income and capital mobility.

The present model is an extension of the Global Trade Analysis Project (GTAP) model (Hertel, 1997) aimed at including MNEs and foreign direct investment (FDI) flows. GTAP is a world model for conducting quantitative analysis of international policy issues. It can be extended for specific research purposes. Our version of GTAP focuses in a former communist country that has experienced a huge change in its automotive industry due to the arrival of FDI; Latorre et al. (2009) offer a wide description of the general features of this extension and its equations. It includes MNEs in a 2-region, 2-factor, 20-sector static general equilibrium model of the world economy, with which medium term impacts of different shocks can be evaluated. The regions are the Czech Republic and the Rest of the World, and the production factors are labour and capital.

Regarding firms' behaviour, two main departures from the GTAP standard model arise because of the presence of MNEs. On the one hand, each sector has domestic firms *and* MNEs, which produce different varieties of the same good in the host economy. As shown in the introduction, the presence of MNEs in Czech Motor vehicles is outstanding. Of the 20 sectors modelled only Electronics is close to Motor vehicles with a presence of around 63% of the production accounted by MNEs, whereas production of MNEs in the rest of sectors is usually well below 50%.

A second change with respect to the GTAP model is related to technology. In the model, MNEs and domestic firms produce under constant returns to scale, using as inputs both domestically-produced and imported intermediate goods, as well as two primary factors, labour and capital. However, the differences in technology between national firms and MNEs are in the input-mix: intermediates, labour and capital shares are different between MNEs and national firms. MNEs are much more capital intensive than national firms, and also MNEs import more intermediate inputs as compared to their national counterparts. Furthermore, an additional source of differentiation regarding technology between MNEs and national firms stems from the assumption of specific capital. Capital is modelled as a specific factor in order to proxy the frequent conclusion in the literature that MNEs have some "specific assets" and "ownership advantages", compared to national firms (Hymer, 1976; Barba Navaretti and Venables, 2004; Markusen, 1995, 2002; Helpman, 2006, among others). Capital will therefore exhibit different prices according not only to the type of good for which it is used, as in the standard GTAP model, but also according to whether it is used for production of the foreign or the national variety of that good.

There is a representative household in each region whose income stems from the remuneration of all factors of production and fiscal revenues from several taxes. This agent fully spends her income in investment, private and public consumption. In this static framework, the investment is treated as an exogenous component of the final demand. To prevent biases from government activities in the model, the real level of public consumption does not change. The model includes the feasibility of profit repatriation for MNEs' capital owners in the automobile sector, with the corresponding changes in national incomes.

With respect to the factor markets, labour is fully mobile across sectors and its endowment is exogenously fixed. Capital endowments, in contrast, vary according to MNEs' entry. The arrival of new MNEs' capital leads to changes in the capital stock, i.e., increasing the capital stock held by the "foreign" part of the production of Motor vehicles. In the rest of sectors, the level of capital remains fixed. Note that the extra capital is, then, available for MNEs, whose technology differs from national firms in the manner described above.

This approach involves a high number of equations to be solved simultaneously, and it cannot be solved analytically but numerically using GAMS software (Rutherford, 2005). The software solves the model as a set of nonlinear equations in an optimising framework, where firms maximize profits and the national representative households maximize utility.

3. Data and simulations

The sectoral disaggregation in the model has been chosen in order to use three different sources of data and the maximum number of sectors. The main source has been the GTAP6 Database (Dimaranan, 2007). Most of the production data for the Czech Republic was split into foreign and national shares, corresponding to MNEs and national firms, respectively. The information to assign those shares was obtained from two sources supplying data about MNEs' activities in the Czech Republic: the OECD (several years), and the Czech National Bank (several years)[1].

The model also incorporates a set of elasticities for the production and utility functions. The specific capital assumption is modelled fixing a very low elasticity of transformation of capital across sectors. The elasticity of substitution between national and foreign production within the Czech Republic has the same value to the Armington elasticity between domestic and imported goods. It involves a certain level of differentiation between both types of production. The remaining elasticities are from the GTAP6 Database; see Hertel et al., (2007) for details.

The benchmark equilibrium is a snapshot of the situation of the Czech economy in the year 2001, according to the data explained above. The CGE model is calibrated to this year, which is the first one in which the GTAP6 Database includes the Czech Republic. The monetary variables (incomes and prices) are set with respect to a numeraire due to the Walrasian nature of the model. The numeraire is the Consumer Price Index (CPI).

The FDI in the Czech Motor vehicles industry is simulated as a capital increase in the MNEs' capital stock. It accrues to the foreign capital share of Motor vehicles, while capital in the rest of sectors and in the national share of Motor vehicles remains fixed, due to their sector-specific nature. Notice that FDI tends to take the form of an inflow of capital, rather than that of a merger or acquisition in the case of transition economies, such as the Czech Republic. Some stylized facts support this assumption.
Firstly, the weight of *greenfield* investment in total FDI flows is bigger than for developed countries (Schöllmann, 2001). With respect to the Motor vehicles sector, Pavlínek and Janâk (2007) point out that around 60 greenfield foreign-owned component plants had been built in the Czech Republic to supply Škoda. Secondly, there is evidence of large amounts of obsolete capital stocks in the transition economies (Krkoska, 2001; Bornstein, 2001; Lizal and Svegnar, 2002) and also in the Czech automobile industry (Pavlínek, 2003; Dyker, 2006). This suggests that even the flows linked to acquisitions need to replace the existing capital and consequently are linked to an increase in capital. Thirdly, foreign investors in the Czech Republic have been found to exhibit the highest propensities to invest in gross capital formation (Lizal and Svegnar, 2002).

[1] See, Czech National Bank (several years) *Foreign Direct Investment. Annual Reports*. Available at http://www.cnb.cz/www.cnb.cz/en/statistics/bop_stat/bop_publications/pzi_books/index.html, accessed 14 December 2009 and OECD (several years). "Globalisation: Activities of Multinationals". Available at http://stats.oecd.org/index.aspx?r= 983789

The simulations in the model replicate these changes in the foreign capital flows in the Czech automobile sector. The amount by which foreign capital is increased in the simulations is based on the empirical evidence. Table 3 displays FDI position in the Motor vehicles, i.e., the changes accumulated in the foreign capital stock during the period 1999-2006 in the Motor vehicles sector. This is the period for which the data are available and it can be seen that a high increase has taken place. The GTAP6 Database for the model takes 2001 as benchmark year, so the simulations replicate changes in the foreign capital share of Motor vehicles sector since that year. Those changes come from FDI not only of VW Group, but also the arrival of the projects of the PSA Group in collaboration with Toyota in 2005, and other MNEs projects. Hyundai opened a plant in 2009, so this process has not stopped.

Table 3. Foreign Direct Investment positions in the Czech Republic for Motor vehicles industry.

	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
USD thousands	894527	1370559	1705181	2140738	3953800	4273711	5452674	7377138
Index (year 2001=100)	52.46	80.38	100.00	125.54	231.87	250.63	319.77	432.63

Source: Czech National Bank (several years)

We also consider the effect of repatriation of the remuneration of the foreign capital, and the simulations analyse this issue. It involves that the capital rents will accrue to the income for the foreign country, and not to the Czech Republic. This effect on income can generate some general equilibrium effects that a partial equilibrium model obviates.

Table 2 shows the level of profit repatriation in the Motor vehicles sector, in total manufactures and for the Czech economy as a whole, for the period 2000-2007. Before 2004, the level of profit repatriation is relatively low in Motor vehicles but since 2004 it is beyond 40% for three out of four of the years. Pavlínek and Janâk (2007) detail that till 2004 Škoda had not paid any dividend to its headquarters abroad (Volkswagen Group). This is confirmed with the information in Table 2.

The simulations approximate these changes in both, MNEs capital inflows and profit repatriation schemes. With respect to capital inflows, the simulations include a growth rate running from 1 to 400%, covering a wider range than the real changes displayed in Table 3. With respect to profit repatriation, there is a scenario with no profit repatriation and a set of scenarios with a profit repatriation of 5, 16, 50 and 60% of all the capital rents generated in the Motor vehicles sector by MNEs, also following the empirical evidence for 2001-2006 (see Table 2). “Profit repatriation” should be called “income repatriation”, but we prefer to use that more common term once it is defined what we really denote.

4. Results

4.1. Aggregate results

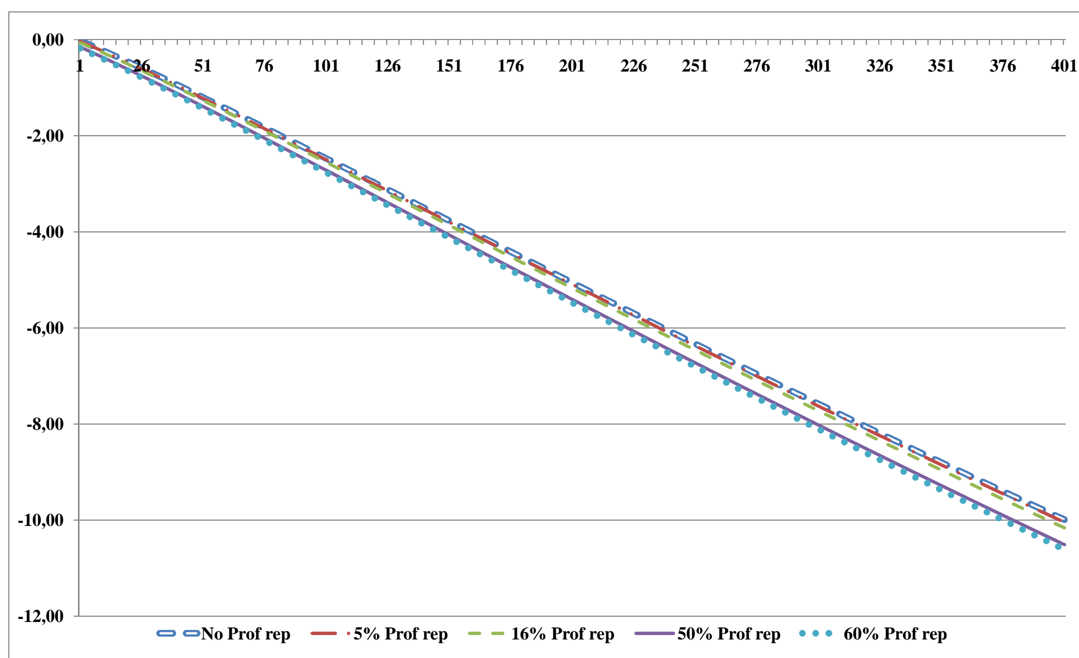
Figures 1 to 7 present the impact on aggregate variables of successively greater increases in the capital stock of foreign MNEs in Motor vehicles (i.e., the percentage increases in the horizontal axis stand for the amount by which the foreign capital stock in Motor vehicles increases, running from a growth of 1% till 400%). There is one Figure for each aggregate variable. These aggregate variables are the rental rate of capital (Figure 1) −a weighted average of its price in all sectors−; the wage in the economy (Figure 2) –the same in all sectors due to the full labour mobility assumption−, the GDP measured at factor costs (Figure 3), welfare (Figure 4) −proxied by the change in real private consumption[2]−; the CPI (Figure 5); and the real value of aggregate imports (Figure 6) and exports (Figure 7).

Each of these Figures offers the effects of a MNEs' capital inflow (i.e., without profit repatriation) and the joint effect of that entry *with* (different levels of) profit repatriation. Each value on the vertical axis in the Figures should be viewed as the medium-term impact of its corresponding percentage capital increase, compared to its benchmark level in the year 2001.

The rental rate of capital (Figure 1) falls after the entry of MNEs with and without profit repatriation. This fall is consistent with the predictions of the theory of international trade under the assumption of specific capital (i.e., Jones, 1971, 2002; Mussa, 1974; Neary, 1978). The rationale is that capital will be less productive if it enters an economy with a fixed labour stock. A consequence of the lower capital productivity is a fall in its remuneration. These initial losses, manifested in the fall in the rental rate of capital after the entry of FDI flows in Motor vehicles, have been well documented for the MNEs that arrived to Central Eastern countries (Dycker, 2006). The fall does not seem very sensitive to the level of profit repatriation, because it is mainly driven by the fall in the rental rate of capital in Motor vehicles which is quite similar with and without profit repatriation. Note that the amount of capital received is the same in both simulations, and its production pattern will be also much the same (see below).

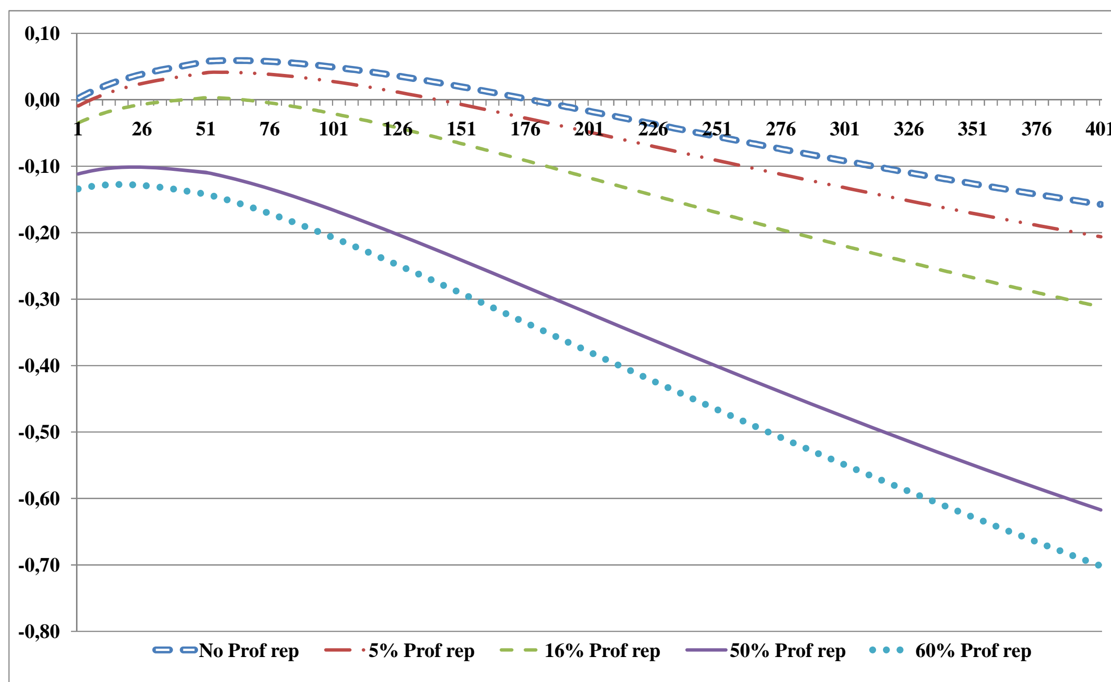
[2] Percentage changes in welfare can be proxied in the GTAP model by the variation in real private consumption (see Hertel, 1997, chapter 1). Additionally, the evolution of real private consumption in the model is the same as the representative household 's variation in real income, to isolate from the changes in government activities.

Figure 1. Effects on aggregate rental rate of capital (percent change from benchmark)



On the other hand, for initial increases in the foreign capital stock (and null or low levels of profit repatriation) the aggregate wage increases (Figure 2). However, when the increase in the capital stock reaches a certain level, the wage begins to fall. The magnitude of the fall is always small with respect to the change in the rental rate of capital, and it depends on the level of capital accumulation and profit repatriation. Thus, the shape of the changes in the wage shows an initial increase and a subsequent decrease for successive increases in the capital stock. This shape is due to the simultaneous presence of two opposite effects. A first effect is the increase in wages due to the increase in labour's productivity (i.e., the addition of more capital makes labour more productive). A second effect is that the higher the amount of capital accumulated, the more intense the fall in its rental rate is. This makes labour relatively more expensive, which induces to substitute capital for labour, leading to reductions in the remuneration of labour. Figure 2 shows that for low levels of foreign capital growth the positive effect dominates, leading to wage increases, but for higher levels of foreign capital growth the negative effect on wages is predominant.

Figure 2. Effects on wages (percent change from benchmark)



The evolution of the GDP (Figure 3) follows the impacts on the remunerations of factors of production. The GDP experiences small increases for those levels in which increases in the wage and in the capital stock, (with no or very small levels of capital income repatriation), predominate over the fall in the rental rate of capital. In a similar way, and also following the evolution of factor remunerations, welfare (Figure 4) only experiences small positive increases when there is no profit repatriation and the increases in the capital stock are below a 275% level. Note, however, that profit repatriation has a direct and more intense effect on welfare (and private consumption), which reflects the reduction in the income now sent abroad. By contrast, the impact of profit repatriation on GDP is not so straight because capital is still producing in the Czech economy, although its remuneration goes offshore.

Figure 3. Effects on GDP (percent change from benchmark)

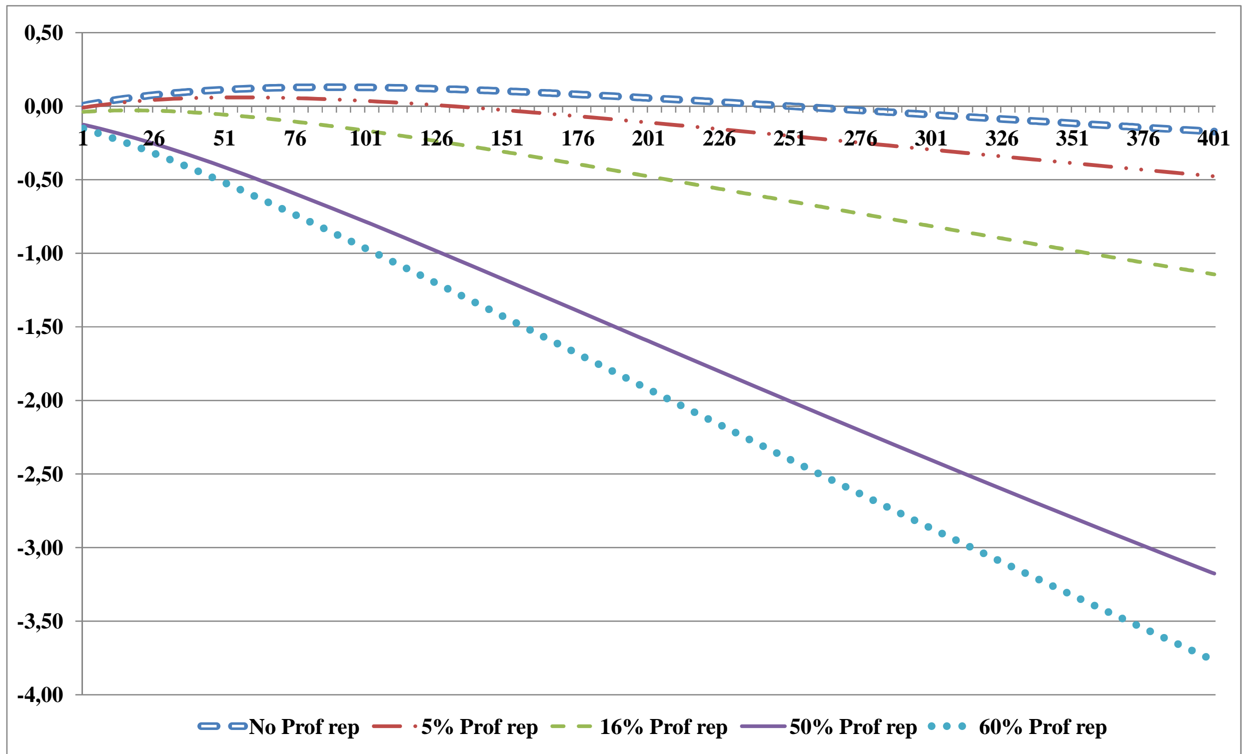
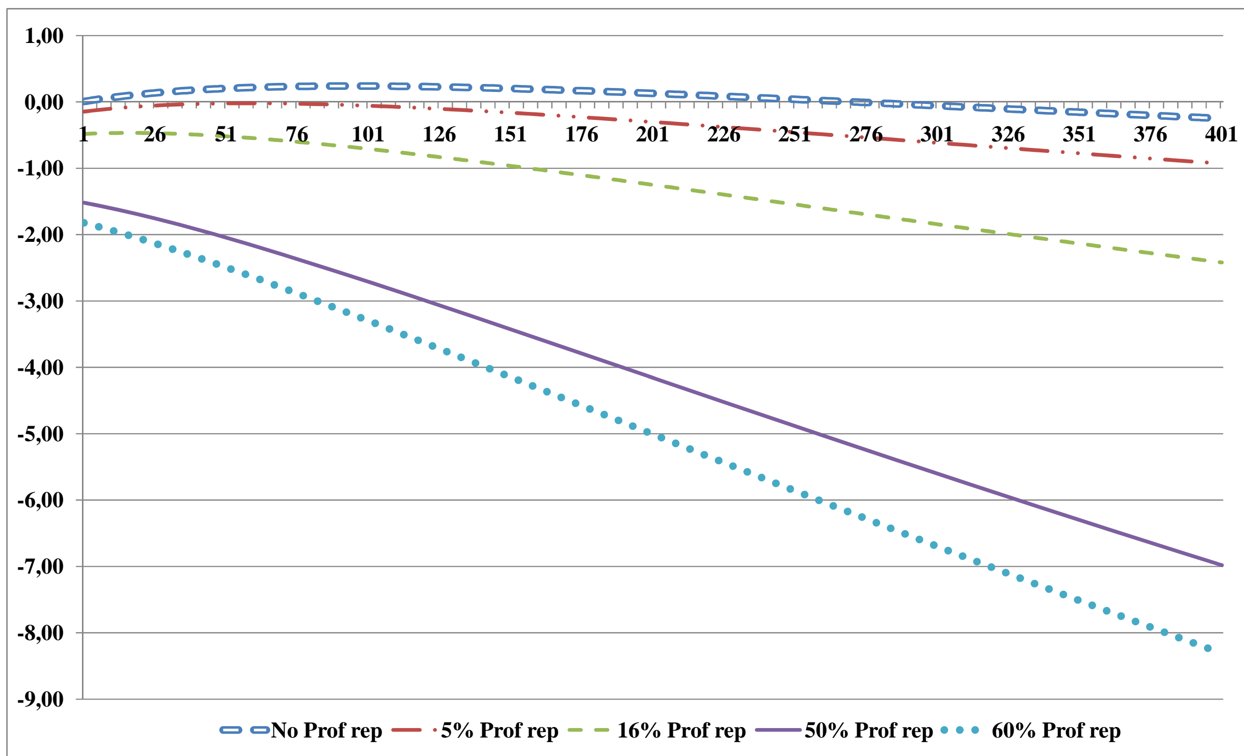
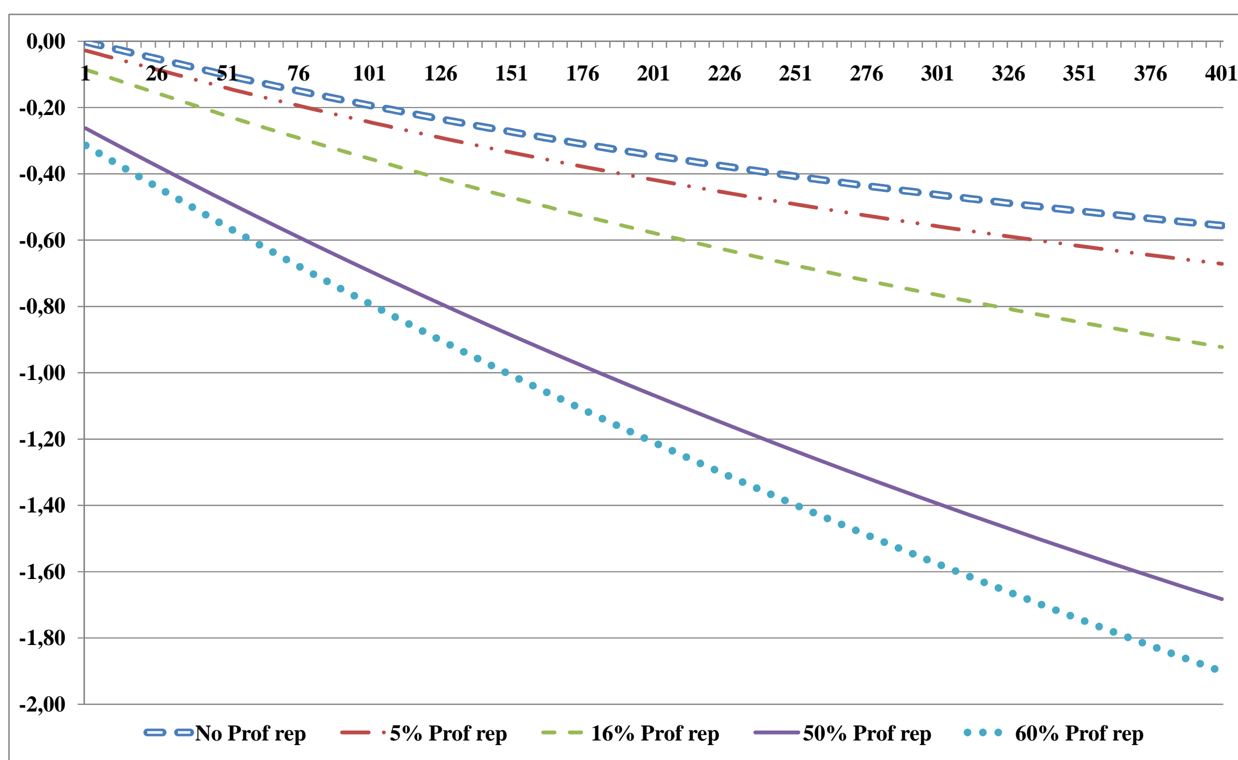


Figure 4. Effects on welfare (percent change from benchmark)



The fall in the CPI (Figure 5) is related to the fall in the price in Motor vehicles after the entry of foreign capital[3]. The sector of Motor vehicles accounts for nearly 4% of private consumption (based on GTAP6 Database), so these goods represent a relevant share of CPI**.** Prices in other sectors also fall, due to lower costs: wages and rental of capital fall. The deeper reduction in the CPI when we consider profit repatriation would be due to the fall in aggregate demand following a reduction in Czech income.

Figure 5. Effects on CPI (percent change from benchmark)



Foreign trade (Figures 6 and 7) increases with the level of capital accumulated. The export growth is fuelled by the fall in the price of Motor vehicles and other goods. The level of profit repatriation has a negligible impact on aggregate imports and exports. This is because the evolution of aggregate imports and exports mainly reflects the impact on trade flows for Motor vehicles and of its main domestic supplier Machinery and equipment. Profit repatriation does not affect to an important extent the level of foreign trade in those sectors.

[3] The CPI is the numeraire for the rest of variables in the model, although the CPI itself is expressed with respect to the rest of the World (ROW) income. This means that CPI values, strictly, cannot be interpreted as a standard CPI. But note that, for the simulations performed here, the impact on the income of ROW is negligible, since shocks in the Czech Republic are unlikely to affect ROW to an important extent. So, for our simulations, eventually, the evolution of the CPI in terms of the income of ROW should be a good proxy for the evolution of a standard CPI.

Figure 6. Effects on aggregate imports (percent change from benchmark)

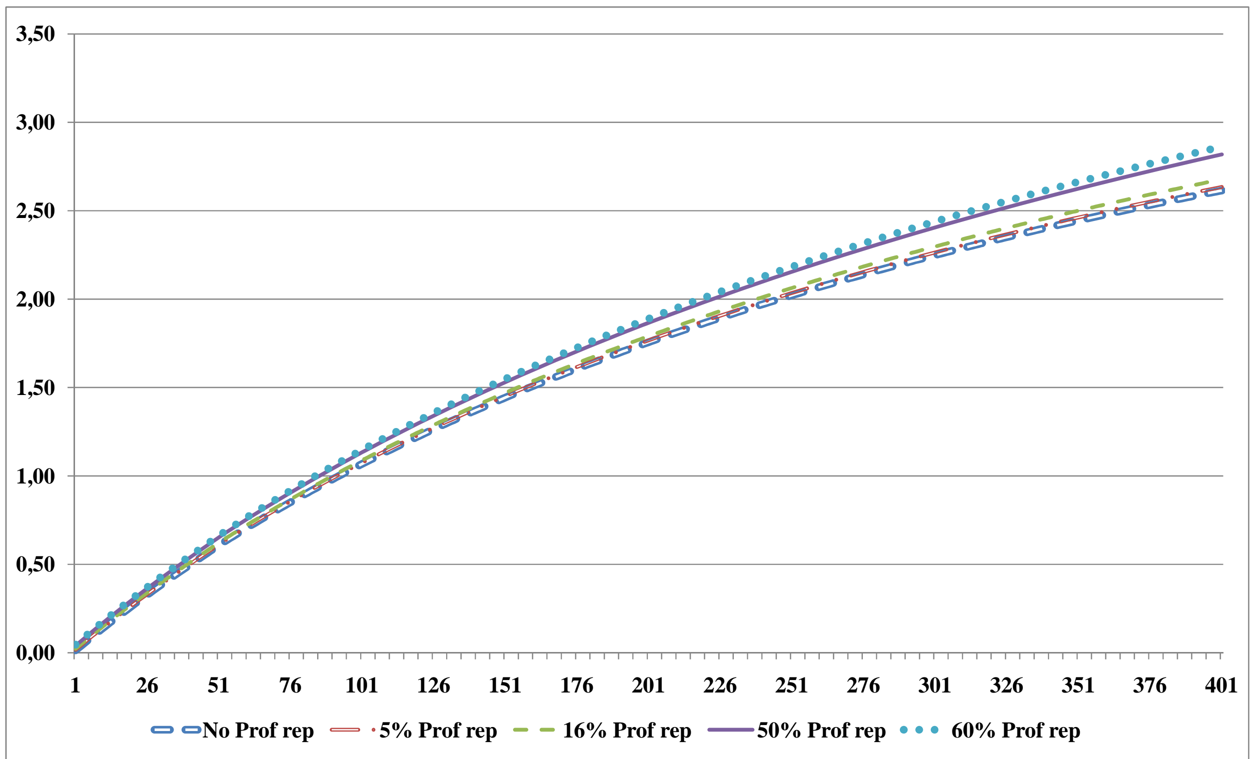
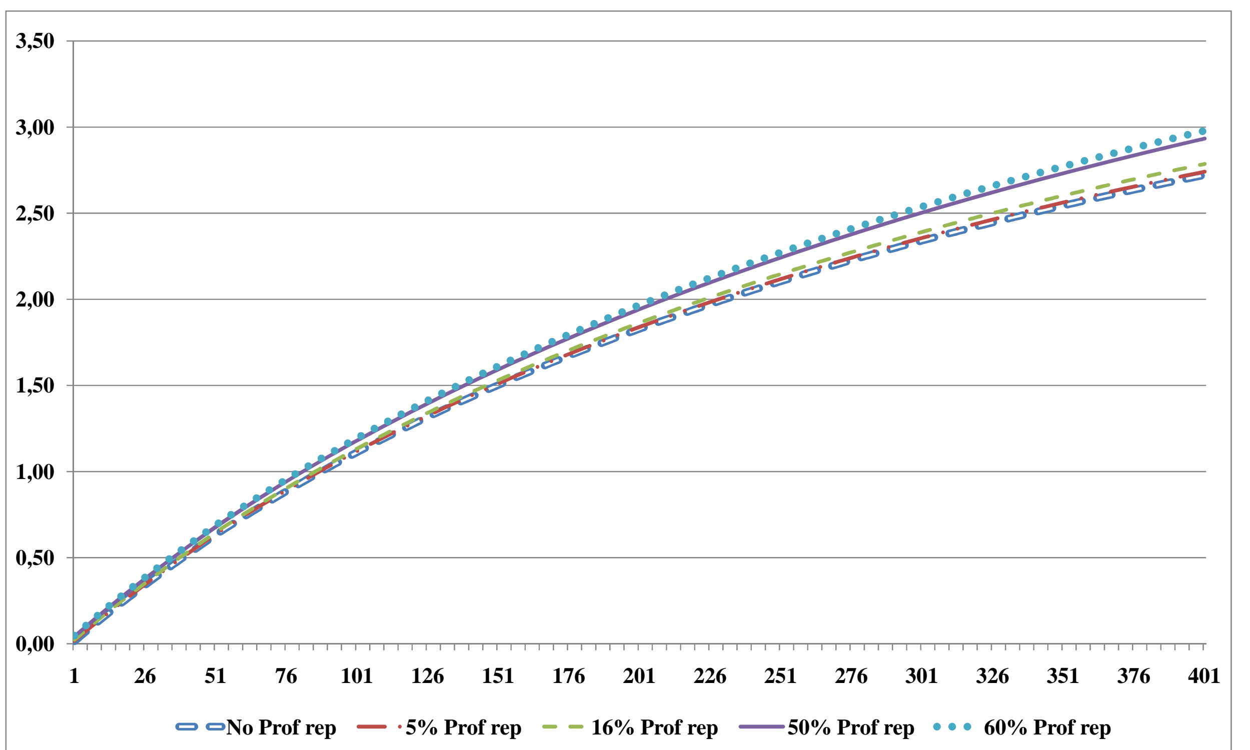


Figure 7. Effects on aggregate exports (percent change from benchmark)



Besides the previous comments on the macro variables, Table 4 includes some results for specific scenarios. In particular, it offers the estimations for the impact on aggregate variables of the FDI position in the Motor vehicles reflected in Table 3 (i.e., the FDI flows accumulated after the 2001 benchmark levels) together with the profit repatriation levels that have been *really experienced* in the Czech Republic (Table 2), in the years for which that information is available. Thus, Table 4 shows tiny changes for GDP and welfare in periods with both low capital accumulation and profit repatriation, and more sizeable negative effects on these variables when there are important levels of capital accumulation and profit repatriation. The negative effects on wages and capital rents are determinant on GDP and welfare, given the assumption on full employment of factors. Note that the quantitative effect on GDP and welfare is remarkable when the growth rate in the foreign capital stock and profit repatriation are high. Table 4 also includes the effects of the corresponding FDI positions if profit repatriation is *absent* (results in brackets). This shows the negative effect of profit repatriation.

These findings of tiny increases in GDP and welfare or even the negative effects on these variables seem consistent with the existing literature on MNEs acting in the Czech Motor vehicles. This literature has emphasised the idea that the activities undertaken by MNEs in Motor vehicles are not of a great value added (Pavlínek, 2003), and, in particular, the high-volume production of small passenger cars and the low-volume assembly of special models (Pavlínek et al., 2009). MNEs in Czech Motor vehicles have recourse to foreign suppliers for almost all high-value components (Dycker, 2006; Pavlínek and Janâk, 2007; Pavlínek et al., 2009). There has been a declining share of high-value added exports of Motor vehicles from the Czech Republic, combined with a limited development of R&D (Pavlínek et al., 2009). Haiss et al., (2009) provide evidence of a low impact in terms of GDP growth of FDI inflows going to the automotive industry in Central and Eastern Europe. Finally, our previous analysis with a less specific simulation (Latorre et. al., 2009) showed that this impact of MNEs acting in the Motor vehicles sector of the Czech Republic seems to be the least profitable for that country among a group of sectors analysed which included Chemicals, Electronics, Trade and Finance.

4.2. Sectoral results

The changes in production, labour demand, exports and imports present several features at the sectoral level that shed light on the aggregate effects of MNEs. The economy is split in 20 sectors. Tables 5 to 8 show several scenarios according to the real data of changes in foreign capital and profit repatriation for the subsequent periods between 2001-2006 (in a structure analogous to that of Table 4).

The effects on production are displayed in Table 5. The entrance of foreign capital in Motor vehicles enhances the production possibilities and there is a correlation between the capital inflow and Motor vehicles production. The profit repatriation does not seem to have a relevant effect on Motor vehicles output (recall that the results in brackets are *without* profit repatriation). The intermediate inputs linkages of Motor vehicles with the sectors Machinery and equipment and Basic and fabricated metal products also cause the growth in production in these latter sectors.

Table 4. Simulation results: Effects on aggregate variables (percent change from benchmark)

	% Capital increase	% Profit repatriation	Rental rate of capital	Wage	GDP	Welfare	CPI	Imports	Exports
2001-2002	25%	5% (0%)	*-0.58* *(-0.57)*	0.02 (0.04)	0.04 (0.07)	*-0.06* (0.13)	*-0.08* *(-0.05)*	0.32 (0.32)	0.33 (0.33)
2001-2003	132%	6% (0%)	*-3.30* *(-3.27)*	0.01 (0.03)	0.00 (0.11)	*-0.12* (0.22)	*-0.30* *(-0.24)*	1.32 (1.31)	1.37 (1.36)
2001-2004	150%	50% (0%)	*-4.04* *(-3.74)*	*-0.24* (0.02)	*-1.19* (0.10)	*-3.41* (0.20)	*-0.88* *(-0.27)*	1.52 (1.44)	1.59 (1.50)
2001-2005	220%	60% (0%)	*-5.98* *(-5.55)*	*-0.41* *(-0.03)*	*-2.11* (0.04)	*-5.33* (0.10)	*-1.28* *(-0.37)*	2.01 (1.86)	2.09 (1.94)
2001-2006	333%	16% (0%)	*-8.52* *(-8.37)*	*-0.25* *(-0.11)*	*-0.92* *(-0.10)*	*-2.03* *(-0.12)*	*-0.82* *(-0.50)*	2.43 (2.38)	2.53 (2.47)

Note: “% Capital increase” reflects the amount of capital accumulated by MNEs in motor vehicles since the benchmark year. “% Profit repatriation” indicates the amount of capital hold by MNEs in Motor vehicles whose remuneration is sent abroad. Results in brackets are for the simulations without profit repatriation of the corresponding increase in the capital hold by MNEs presented in column 1. Negative values appear in italics.

“Food, beverages and tobacco” (Food, henceforth), Petroleum, “Electricity, gas, water supply and construction” (Electricity, henceforth) and the service sectors, with the exception of Transport, storage and communication, are the only sectors reducing production in some scenarios. These sectors, in general, have very weak links at intermediate input level with Motor vehicles. Besides, they are more responsive to the evolution of private consumption than to the evolution of exports. Private consumption just follows income. Consumption increases with the entry of FDI flows without profit repatriation, leading to general increases in production in these sectors for which it is more important. But income (and consumption) declines with profit repatriation. As a consequence, Food, Petroleum, Electricity and most services will experience a reduction in demand which pulls down their production levels (or leads to lower production levels) when there is profit repatriation. On the contrary, most manufacturing sectors (and Transport, storage and communication) are more export oriented. This will lead to a pattern of production in which the presence of profit repatriation leads to higher output because profit repatriation involves lower prices (i.e., a bigger fall in the CPI) which will increase the demand for exports of their products in the Rest of the World. As a consequence, this latter group of sectors follows the opposite pattern to those more responsive to the evolution of private consumption.

The evolution of production affects labour demand in these sectors (see Table 6). In Motor vehicles a substitution effect takes place. The price of capital decreases as foreign capital enters the sector. This stimulates the substitution of capital as abundant and cheap factor for labour that remains comparatively scarce. The labour not employed now in Motor vehicles is employed in the remaining sectors, with a few exceptions. These occur in several scenarios in the sectors: Food, Petroleum, Electricity and most services sectors for the reasons explained above. On the other side, Machinery and equipment sector, with strong linkages with Motor vehicles, absorbs a significant amount of the labour freed from the Motor vehicles sector. To a certain extent, the Basic and fabricated metal products sector also contracts more labour. The increased production of Machinery and equipment and Basic and fabricated metal products because of links with Motor vehicles must be made through more workforce in these sectors.

The foreign trade flows are displayed in Table 7 (exports) and Table 8 (imports). The increase in exports of Motor vehicles is higher than the increase in production, as usual for automobile firms located in a small economy. The supply growth and the lower costs due to the fall in wages and the rental rate of capital bring about a price decrease in these goods, and this encourages the exports to the rest of the world, where prices almost remain invariable because of the small size of the Czech economy. This is the most outstanding change in the evolution of sectoral exports, it is not influenced by profit repatriation and drives the tendency in the aggregate value of exports. At a lower scale, a similar effect takes place for the exports of the Machinery and equipment and Basic and fabricated metals. Furthermore, all sectors in almost all the scenarios share this export expansion feature. Nevertheless, in the sectors different than Motor vehicles, the expansion depends on the profit repatriation schemes. As noted above, when there is profit repatriation, Czech prices

Table 5. Simulation results: Effects on sectoral production (percent change from benchmark)

	2001-2	2001-3	2001-4	2001-5	2001-6
	25% Capital increase	132% Capital increase	150% Capital increase	220% Capital increase	333% Capital increase
	5% (0%) Prof rep	6% (0%) Prof rep	50% (0%) Prof rep	60%(0%) Prof rep	16%(0%) Prof rep
Agriculture, hunting and fishing	0.01 (0.02)	0.08 (0.08)	0.05 (0.09)	0.06 (0.12)	0.14 (0.16)
Mining and quarrying	0.00 (0.00)	0.01 (0.01)	0.06 (0.01)	0.09 (0.02)	0.05 (0.03)
Food, beverages and tobacco	*-0.02* (0.06)	0.02 (0.15)	*-1.28* (0.15)	*-2.00* (0.15)	*-0.65* (0.12)
Textiles, wearing apparel, leather, footwear	0.07 (0.03)	0.35 (0.28)	1.04 (0.32)	1.56 (0.49)	1.09 (0.71)
Wood and wood products, except furniture	0.08 (0.02)	0.37 (0.26)	1.45 (0.30)	2.20 (0.47)	1.32 (0.71)
Paper; printing and publishing	0.06 (0.03)	0.29 (0.23)	0.94 (0.26)	1.41 (0.40)	0.94 (0.58)
Petroleum	*-0.02* (0.03)	*-0.04* (0.06)	*-0.97* (0.05)	*-1.52* (0.03)	*-0.56 (-0.02)*
Chemicals, rubber and plastics	0.08 (0.04)	0.33 (0.26)	1.04 (0.29)	1.55 (0.43)	1.02 (0.62)
Non-metallic mineral products	0.08 (0.03)	0.34 (0.26)	1.15 (0.31)	1.73 (0.46)	1.12 (0.67)
Basic and fabricated metal products	0.11 (0.03)	0.48 (0.34)	1.98 (0.40)	3.00 (0.62)	1.78 (0.94)
Motor vehicles	9.05 (9.02)	37.38 (37.32)	41.70 (41.00)	54.49 (53.35)	68.90 (68.46)
Other transport equipment	0.19 (0.15)	0.74 (0.68)	1.39 (0.75)	1.96 (0.99)	1.64 (1.30)
Electronics	0.09 (0.02)	0.40 (0.28)	1.53 (0.33)	2.32 (0.52)	1.41 (0.78)
Machinery and equipment n.e.c.	1.03 (0.99)	3.80 (3.72)	4.85 (4.05)	6.31 (5.09)	6.72 (6.28)
Furniture, manufacturing n.e.c.	0.05 (0.04)	0.28 (0.25)	0.62 (0.29)	0.92 (0.42)	0.76 (0.58)
Electricity, gas and water supply; construction	0.01 (0.04)	0.13 (0.18)	*-0.38* (0.20)	*-0.61* (0.26)	0.01 (0.32)
Trade, repair; hotels and restaurants	0.05 (0.10)	0.28 (0.37)	*-0.59* (0.40)	*-1.00* (0.50)	0.07 (0.59)
Transport, storage and communication	0.06 (0.05)	0.28 (0.27)	0.47 (0.30)	0.66 (0.41)	0.64 (0.55)
Finance, insurance, real estate, business activities	0.02 (0.03)	0.11 (0.13)	*-0.05* (0.14)	*-0.12* (0.17)	0.10 (0.20)
Other services	0.00 (0.02)	0.05 (0.09)	*-0.32* (0.10)	*-0.51* (0.12)	*-0.08* (0.15)

Note: The definitions of the sectors follow the ISIC Rev 3 Classification. See also note of Table 4.

Table 6. Simulation results: Effects on labour demand (percent change from benchmark)

	2001-2	2001-3	2001-4	2001-5	2001-6
	25% Capital increase	132% Capital increase	150% Capital increase	220% Capital increase	333% Capital increase
	5% (0%) Prof rep	6% (0%) Prof rep	50% (0%) Prof rep	60%(0%) Prof rep	16%(0%) Prof rep
Agriculture, hunting and fishing	0.03 (0.03)	0.15 (0.16)	0.10 (0.18)	0.12 (0.24)	0.28 (0.32)
Mining and quarrying	0.02 (0.01)	0.09 (0.06)	0.36 (0.08)	0.54 (0.12)	0.33 (0.18)
Food, beverages and tobacco	*-0.05* (0.14)	0.02 (0.35)	*-3.20* (0.36)	*-4.99* (0.34)	*-1.66* (0.24)
Textiles, wearing apparel, leather, footwear	0.11 (0.05)	0.58 (0.47)	1.72 (0.54)	2.59 (0.82)	1.82 (1.19)
Wood and wood products, except furniture	0.18 (0.05)	0.77 (0.55)	3.07 (0.64)	4.65 (1.00)	2.78 (1.49)
Paper; printing and publishing	0.14 (0.06)	0.66 (0.51)	2.14 (0.59)	3.22 (0.90)	2.13 (1.31)
Petroleum	*-0.10* (0.14)	*-0.18* (0.26)	*-4.40* (0.25)	*-6.83* (0.14)	*-2.55 (-0.08)*
Chemicals, rubber and plastics	0.18 (0.08)	0.78 (0.61)	2.50 (0.70)	3.73 (1.03)	2.43 (1.47)
Non-metallic mineral products	0.18 (0.07)	0.81 (0.62)	2.72 (0.72)	4.09 (1.08)	2.64 (1.57)
Basic and fabricated metal products	0.18 (0.04)	0.83 (0.57)	3.38 (0.68)	5.14 (1.06)	3.04 (1.61)
Motor vehicles	*-5.92 (-5.98)*	*-26.63 (-26.72)*	*-28.62 (-29.53)*	*-37.81 (-39.03)*	*-50.13 (-50.49)*
Other transport equipment	0.36 (0.30)	1.45 (1.33)	2.73 (1.48)	3.86 (1.96)	3.23 (2.56)
Electronics	0.16 (0.05)	0.73 (0.52)	2.76 (0.62)	4.19 (0.96)	2.57 (1.43)
Machinery and equipment n.e.c.	2.33 (2.24)	8.73 (8.65)	11.17 (9.31)	14.62 (11.77)	15.64 (14.61)
Furniture, manufacturing n.e.c.	0.11 (0.07)	0.56 (0.50)	1.24 (0.57)	1.83 (0.83)	1.53 (1.17)
Electricity, gas and water supply; construction	0.03 (0.10)	0.30 (0.42)	*-0.86* (0.46)	*-1.39* (0.59)	0.03 (0.73)
Trade, repair; hotels and restaurants	0.09 (0.19)	0.52 (0.70)	*-1.16* (0.75)	*-1.96* (0.93)	0.08 (1.09)
Transport, storage and communication	0.14 (0.12)	0.65 (0.61)	1.05 (0.69)	1.48 (0.94)	1.45 (1.25)
Finance, insurance, real estate, business activities	0.05 (0.07)	0.28 (0.33)	*-0.17* (0.36)	*-0.33* (0.46)	0.30 (0.57)
Other services	0.00 (0.03)	0.08 (0.13)	*-0.46* (0.14)	*-0.73* (0.18)	*-0.11* (0.21)

Note: See Table 5.

become relatively cheaper (i.e., the CPI falls by more), augmenting the demand for Czech products. That is why with profit repatriation exports are higher than when there is not. Note that the percentage increases in exports are particularly noticeable for the sectors that are more oriented to private consumption. This is because their low initial levels of exports make relatively small increases more apparent in percentage terms.

The sectoral imports (Table 8) do not follow an expansion comparable to exports. The higher increase in imports takes place in Motor vehicles due to higher production levels, which is again the main force driving aggregate imports independently of profit repatriation, and to a lesser extent in Machinery and equipment. But the rates are lower than the ones for exports. Imports in the rest of sectors are influenced by two counteracting forces. On the one hand, in the scenarios with profit repatriation, there is a negative effect on imports. More profit repatriation corresponds to a lower income level in the Czech Republic and, correspondingly, to less imports. On the other hand, the increases in production occurring in most sectors (with the exception of those more devoted to private consumption with profit repatriation) pulls the demand for imports up, because they are linked to imported intermediates which are necessary for production.

Table 8 shows that imports tend to fall slightly in those sectors for which Table 5 reports falls or minor increases in production, suggesting a pattern in which the use of imports as intermediates production predominates. Furthermore, one can see that with profit repatriation the lower income in the Czech Republic reduces the demand for imports compared to the case of no profit repatriation. Exceptions to this latter tendency occur, however, in Wood and wood products, Non-metallic mineral products, Basic and fabricated metal products and Electronics. In these exceptional sectors, the higher level of production with profit repatriation and the corresponding demand for imported intermediates prevails over the fall in rents in the host economy.

Finally, the important increase in exports coupled with a lower increase in imports for Motor vehicles is consistent with the evidence of increasing surplus in Motor vehicles' foreign trade. In fact, the Czech trade surplus in Motor vehicles was present even before transition and in 2006 was the highest among European countries except for Germany (Pavlínek et al., 2009).

4.3 Sensitivity analysis

We look now at how robust previous results are, when we change the values of the different elasticities in the model. The impact of the whole period 2001-2006, somehow, gathers and summarises the whole evolution for which we have data. Therefore, we re-run in this section that simulation, but changing the values of the main elasticities involved in the shock. These are the elasticity of substitution between labour and capital (which measures the flexibility to substitute labour and capital in production), the Armington elasticities (capturing the degree of the differentiation between national and foreign goods), the elasticity of substitution between national and MNEs firms output (which grasps the differentiation between both types of production) and the elasticity of capital transformation across sectors (related to the mobility of capital across sectors and between the foreign and national part of each sector). To simplify, we perform a Conditional Systematic

Table 7. Simulation results: Effects on sectoral exports (percent change from benchmark)

	2001-2	2001-3	2001-4	2001-5	2001-6
	25% Capital increase	132% Capital increase	150% Capital increase	220% Capital increase	333% Capital increase
	5% (0%) Prof rep	6% (0%) Prof rep	50% (0%) Prof rep	60%(0%) Prof rep	16%(0%) Prof rep
Agriculture, hunting and fishing	0.14 *(-0.04)*	0.46 (0.14)	3.60 (0.20)	5.56 (0.41)	2.54 (0.74)
Mining and quarrying	0.01 (0.00)	0.03 (0.01)	0.25 (0.01)	0.38 (0.02)	0.17 (0.05)
Food, beverages and tobacco	0.26 *(-0.06)*	0.92 (0.36)	6.65 (0.46)	10.35 (0.89)	4.80 (1.55)
Textiles, wearing apparel, leather, footwear	0.13 (0.00)	0.55 (0.31)	2.95 (0.38)	4.51 (0.65)	2.40 (1.04)
Wood and wood products, except furniture	0.09 (0.01)	0.36 (0.23)	1.65 (0.28)	2.50 (0.45)	1.41 (0.68)
Paper; printing and publishing	0.08 (0.00)	0.32 (0.18)	1.76 (0.21)	2.68 (0.36)	1.40 (0.58)
Petroleum	0.04 *(-0.01)*	0.14 (0.06)	0.95 (0.07)	1.45 (0.14)	0.70 (0.23)
Chemicals, rubber and plastics	0.08 (0.02)	0.31 (0.21)	1.31 (0.25)	1.97 (0.38)	1.13 (0.57)
Non-metallic mineral products	0.05 (0.01)	0.23 (0.16)	0.93 (0.19)	1.39 (0.30)	0.83 (0.45)
Basic and fabricated metal products	0.08 (0.02)	0.38 (0.26)	1.60 (0.30)	2.42 (0.48)	1.42 (0.73)
Motor vehicles	11.38 (11.33)	47.38 (47.26)	53.22 (51.97)	69.84 (67.82)	88.06 (87.28)
Other transport equipment	0.20 (0.12)	0.77 (0.63)	2.20 (0.70)	3.22 (0.97)	2.12 (1.32)
Electronics	0.08 (0.02)	0.37 (0.25)	1.59 (0.30)	2.40 (0.47)	1.40 (0.72)
Machinery and equipment n.e.c.	0.99 (0.93)	3.64 (3.54)	5.01 (3.85)	6.61 (4.85)	6.64 (6.01)
Furniture, manufacturing n.e.c.	0.14 (0.00)	0.55 (0.30)	3.05 (0.36)	4.66 (0.62)	2.42 (1.00)
Electricity, gas and water supply; construction	0.15 *(-0.02)*	0.56 (0.24)	3.68 (0.31)	5.66 (0.57)	2.74 (0.96)
Trade, repair; hotels and restaurants	0.23 (0.04)	0.87 (0.53)	4.36 (0.62)	6.65 (0.99)	3.48 (1.51)
Transport, storage and communication	0.12 (0.04)	0.47 (0.32)	1.93 (0.37)	2.90 (0.56)	1.65 (0.83)
Finance, insurance, real estate, business activities	0.24 (0.07)	0.71 (0.41)	3.71 (0.45)	5.56 (0.60)	2.54 (0.80)
Other services	0.18 (0.02)	0.79 (0.49)	3.72 (0.59)	5.69 (0.96)	3.15 (1.50)

Note: See Table 5.

Table 8. Simulation results: Effects on sectoral imports (percent change from benchmark)

	2001-2	2001-3	2001-4	2001-5	2001-6
	25% Capital increase	132% Capital increase	150% Capital increase	220% Capital increase	333% Capital increase
	5% (0%) Prof rep	6% (0%) Prof rep	50% (0%) Prof rep	60% (0%) Prof rep	16% (0%) Prof rep
Agriculture, hunting and fishing	*-0.06* (0.04)	*-0.18* (0.00)	*-1.93 (-0.02)*	*-2.96 (-0.11)*	*-1.27 (-0.26)*
Mining and quarrying	*-0.01* (0.01)	*-0.03* (0.01)	*-0.38* (0.01)	*-0.59 (-0.01)*	*-0.24 (-0.03)*
Food, beverages and tobacco	*-0.17* (0.09)	*-0.54 (-0.07)*	*-5.03 (-0.13)*	*-7.66 (-0.40)*	*-3.41 (-0.82)*
Textiles, wearing apparel, leather, footwear	*-0.05* (0.05)	*-0.11* (0.06)	*-1.72* (0.05)	*-2.64* (0.00)	-1.04 (-0.11)
Wood and wood products, except furniture	0.03 (0.02)	0.14 (0.12)	0.27 (0.14)	0.40 (0.20)	0.35 (0.29)
Paper; printing and publishing	0.01 (0.03)	0.08 (0.12)	*-0.36* (0.13)	*-0.57* (0.16)	*-0.07* (0.19)
Petroleum	*-0.05* (0.04)	*-0.12* (0.03)	*-1.60* (0.02)	*-2.48 (-0.05)*	*-1.01 (-0.15)*
Chemicals, rubber and plastics	0.03 (0.03)	0.15 (0.16)	0.10 (0.18)	0.12 (0.24)	0.27 (0.31)
Non-metallic mineral products	0.06 (0.04)	0.30 (0.25)	0.82 (0.28)	1.21 (0.41)	0.87 (0.59)
Basic and fabricated metal products	0.05 (0.00)	0.24 (0.15)	1.15 (0.18)	1.75 (0.31)	1.00 (0.49
Motor vehicles	2.02 (2.03)	8.82 (8.83)	9.60 (9.75)	12.67 (12.86)	16.71 (16.76)
Other transport equipment	0.07 (0.09)	0.30 (0.35)	*-0.10* (0.38)	*-0.24* (0.46)	0.31 (0.56)
Electronics	0.06 (0.03)	0.28 (0.23)	0.76 (0.27)	1.14 (0.40)	0.84 (0.58)
Machinery and equipment n.e.c.	0.43 (0.44)	1.58 (1.61)	1.50 (1.74)	1.81 (2.16)	2.50 (2.62)
Furniture, manufacturing n.e.c.	*-0.05* (0.05)	*-0.12* (0.06)	*-1.83* (0.05)	*-2.81 (-0.01)*	*-1.12 (-0.13)*
Electricity, gas and water supply; construction	*-0.08* (0.05)	*-0.24* (-0.01)	*-2.43 (-0.03)*	*-3.71 (-0.15)*	*-1.62 (-0.35)*
Trade, repair; hotels and restaurants	*-0.08* (0.07)	*-0.20* (0.07)	*-2.80* (0.05)	*-4.31 (-0.05)*	*-1.75 (-0.25)*
Transport, storage and communication	*-0.03* (0.02)	*-0.04* (0.05)	*-0.89* (0.05)	*-1.36* (0.03)	*-0.49* (0.00)
Finance, insurance, real estate, business activities	0.00 (0.09)	*-0.03* (0.13)	*-1.62* (0.11)	*-2.56* (0.01)	*-1.09 (-0.18)*
Other services	*-0.09* (0.02)	*-0.34* (-0.13)	*-2.39* (-0.17)	*-3.64 (-0.33)*	*-1.76 (-0.58)*

Note: See Table 5.

Table 9. Sensitivity analysis of for elasticities on the impact in the period 2001-2006 (333% capital increase and 16% (0%) profit repatriation)

		Wage	Rental rate of capital	GDP	Welfare	CPI	Imports	Exports
GTAP elasticities (results in Table 4)	Model	*-0.25 (-0.11)*	*-8.52 (-8.37)*	*-0.92 (-0.10)*	*-2.03 (-0.12)*	*-0.82 (-0.50)*	2.43 (2.38)	2.53 (2.47)
Elasticity of substitution between labour and capital	half	0.10 (0.23)	*-9.35 (-9.20)*	*-1.22 (-0.39)*	*-2.67 (-0.76)*	*-0.89 (-0.51)*	1.86 (1.84)	1.94 (1.92)
	double	*-0.16 (-0.02)*	*-8.52 (-8.38)*	*-0.88 (-0.06)*	*-1.93 (-0.04)*	*-0.80 (-0.53)*	3.00 (2.92)	3.12 (3.04)
Armington elasticity	half	*-0.33 (-0.17)*	*-8.60 (-8.42)*	*-1.01 (-0.16)*	*-2.12 (-0.18)*	*-0.86 (-0.52)*	2.91 (2.76)	3.03 (2.87)
	double	*-0.13 (-0.02)*	*-8.39 (-8.26)*	*-0.79 (0.01)*	*-1.88 (-0.01)*	*-0.75 (-0.46)*	1.63 (1.73)	1.70 (1.80)
Elasticity of substitution between national firms vs MNEs production	half	*-0.28 (-0.14)*	*-8.56 (-8.41)*	*-0.96 (-0.13)*	*-2.09 (-0.18)*	*-0.83 (-0.51)*	2.42 (2.36)	2.51 (2.46)
	double	*-0.21 (-0.07)*	*-8.44 (-8.29)*	*-0.86 (-0.03)*	*-1.92 (-0.01)*	*-0.80 (-0.48)*	2.45 (2.40)	2.55 (2.50)
Elasticity of capital transformation across sectors	Infinite	2.65 (2.88)	*-2.31 (-2.30)*	3.89 (4.73)	6.74 (8.66)	*-0.08* (0.03)	2.60 (2.63)	2.71 (2.73)

Sensitivity Analysis (Harrison et al., 1993). This consists in choosing one of the four elasticities, double and halve its value in all of the twenty sectors of the host economy (while holding the rest of elasticities at their initial benchmark level), and then compare the results for the aggregate variables already analysed above (sectoral results are available upon request).

Table 9 shows, in a structure analogous to that of Table 4, the results obtained when each of the elasticities analysed are multiplied or divided by two, with respective “double” and “half” labels. As usual, the results in brackets are without profit repatriation. In general, higher (lower) level of elasticities, which convey more (less) flexibility in the adjustment, soften (intensify) the quantitative changes in the macro variables. Although the above described patterns of aggregate changes, and the causality that they involve, remain.

For the “double” value of elasticities, production levels in Motor vehicles rise compared to the simulation with standard elasticities in the period 2001-6. Given that the increase in the foreign capital stock remains the same, the labour demand in Motor vehicles will be higher. In order to concentrate more labour in Motor vehicles, higher wages have to be offered. Consequently, the wage is higher (i.e., its fall is smaller) than in the standard case. With higher wages and a similar fall in the rental rate of capital, GDP and Welfare are also higher (i.e., they fall by less). The CPI, which reflects prices, also falls by less compared to the standard case, because less precarious wages imply higher costs. The reverse holds in the case of reductions in elasticities (i.e., “half” values), following the same logic. Although note that for a lower level of the elasticity of substitution between labour and capital, the adjustment is somewhat different. In this latter case, there is more difficulty to allocate labour across sectors, which, in turn, results in an overall increase in the wage of the economy. Lower mobility of labour leads to a use of capital which is less productive, resulting in a more sizeable fall in its rental rate. This result of the fall of the remuneration of capital predominates and exacerbates negative results on aggregate variables, despite the more positive effect on wages.

The pattern of external trade does not follow a similar trend when we use “double” values of all the elasticities. The exception occurs with the Armington elasticity, which deals with the substitution between national and foreign goods. Higher Armington elasticities, implying easier substitution between national and foreign goods, make the cheaper (the CPI falls) domestic production more attractive, resulting in a fall of imports compared to our standard results. On the other hand, higher levels of substitution between labour and capital lead to higher production in Motor vehicles which, in turn, results in a rise of imports (used as intermediates) and exports (stemming from a jump in their supply which makes them cheaper). Recall that, aggregate imports and exports are mainly driven by this evolution of Motor vehicles. On the other hand, the elasticity of substitution between national firms and MNEs has no impact on foreign trade, since the shock concentrates in the foreign part of Motor vehicles which, in turn, is the main determinant of the aggregate adjustment.

Finally, the sensitivity analysis with a value of infinity for the elasticity of capital transformation across sectors, depicts the situation in which capital can move freely. This assumption is just the opposite extreme to the assumption of specific capital, by which capital is fixed in the national and the foreign part of each sector and across sectors. Note that we obtain a very positive impact of FDI inflows on aggregate variables with the new

value for this elasticity. We regard this result as a suggestion that there is scope for capital to be very productive in the Czech Republic, but this is not the situation for the one going to Motor vehicles in which some saturation effects have arisen. Foreign capital employed in other sectors could well contribute to better outcomes on GDP and welfare as shown in Latorre et al., (2009).

5. Concluding comments

The fall of the Berlin Wall opened new markets for western MNEs. One of the most striking processes of MNEs' entry has taken place in the sector of Motor vehicles in some Central European countries. Around 90% of a progressively increasing production is manufactured by MNEs. This has led to a reorganisation in Europe's car production.

The article provides a set of results of the economy wide impact of this process in a host economy, namely, the Czech Republic. To this aim, we introduce the differences in technology between national and MNEs firms, the observed growth rates in the foreign capital stock, and profit repatriation levels experienced in that country in a computable general equilibrium (CGE) framework. We obtain that the widening of MNEs capital stock in Motor vehicles generates a small positive impact on GDP and welfare. However, when foreign capital becomes more than three times bigger, and when the level of profit repatriation is introduced in the analysis, GDP and welfare experience reductions. The fall becomes more sizeable the bigger the capital increases and the profit repatriation levels.

The main impact of the shock takes place, logically in Motor vehicles, leading to important increases not only in sectoral imports but especially in production and exports. These changes pull production, imports and exports in the sector of Machinery and equipment and, to a certain extent, in the sector of Basic and fabricated metal products. Both are the main upstream sectors of Motor vehicles and involve low value added tasks and occupations. Backward and forward linkages for the rest of sectors are weaker.

The results displayed in the article show how a relevant change in a sector is spread across the economy. The general equilibrium framework provides an evaluation of the influence of the Motor vehicles sector in the whole economy and the inclusion of the demand side seems of particular relevance since the impact of profit repatriation is crucial. The prominent role of MNEs in this sector can generate some effects that policymakers should take into account when designing policy measures, such as, the role of profit repatriation in national welfare, the distributional effects because of changes in factor rents and the differential impact on production across sectors.

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