Trade Integration and Industrial Specialization in Central Europe

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Abstract

In this paper we study the impact of trade integration on the degree of industrial specialization in thirteen countries of Central and Eastern Europe. The results show that trade integration leads to long-run industrial specialization in these countries. In contrast, an earlier paper by Beine & Coulombe (2004) on industrial specialization in Canada finds long run diversification as a result of trade liberalization with the U.S. Given that the Central and East European countries are still in an earlier stage of development than Canada, we interpret the different results that we obtain as evidence that the relationship between trade liberalization and industrial specialization is not a monotonic one, but can differ along the development path.

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1 Introduction

The effect of trade integration has always been one of the most important issues studied in the area of international economics. The proliferation of trade agreements during the last decade led the policy makers to pay increasing attention to the various impacts of further integration. The traditional effects that are considered involved among others economic growth, efficiency, political and economic institutions and last but not least economic structures.

The current and future enlargement of the European Union is one of the most debated recent integration episode. While a lot of concerns have been raised in current member countries, it is often taken for granted that integration of the Eastern European countries will yield important benefits in terms of efficiency, growth, employment and wealth. While we share this view, we think that much less attention has been devoted on one of the possible more detrimental effects of integration. In this paper, we will focus on one aspect of this kind, namely economic specialization.

The new economic geography theory initiated by Krugman (1991a) and Krugman (1991b) suggests that trade integration might lead to agglomeration and specialization of economic activities. The evidence of the evolution of the US state of Massachussets (Krugman 1993) tends to support these theoretical predictions. The evolution of economic specialization is an important macroeconomic issue since the degree of specialization reflects the exposure of the country (or the region) to important external sectorial shocks. The case study of Massachussets provided by Krugman (1993) suggests that adverse sectorial shocks in major fields of activity (namely electronic and military aeronautic sectors) might exert major economic consequences in terms of aggregate activity, employment and workers' displacement.

In this paper, we investigate to what extent the trade integration process between the European union and the Central and Eastern European countries gives rise to more or less specialization of economic activities of the latter countries. We focus on export specialization and hence on the exposure of these countries to external (demand) shocks. Given the relatively high initial levels of specialization and their high degree of openness, this issue is of overwhelming importance for the Central and Eastern European economies.

To investigate such effects, we build on the previous approach proposed by Beine & Coulombe (2004) and applied to Canadian provinces. Their idea is to combine the cross-sectional and the time series information to capture the relationship between integration and specialization in a more consistent way than done in a pure time-series approach. Adopting such an approach to Central and Eastern countries is called for given the relative low number of years of trade integration with the European Union (at most 12 years depending on the countries). The high degree of heterogeneity across these countries with respect to their integration with the EU allows to identify short-run and long-run effects in terms of specialization. Our findings lead us to conclude in favor of a positive relationship between integration and specialization and therefore shed light on an important trade-off related to the enlargement process.

The paper is organized as follows. Section 2 reviews the theoretical background and the empirical literature on the relationship between trade integration and

specialization. Section 3 gives details on the data used subsequently in the econometric investigation while section 4 is devoted to the methodology. Section 5 discusses the results and section 6 briefly concludes.

2 Literature

The relationship between trade integration and industrial specialization is not fully clear from the theory. Neo-Classical trade theory predicts a linear positive relationship between trade costs and specialization. Trade liberalization and economic integration will result in increasing specialization in sectors where a country has a comparative advantage due to differences in technology or factor endowments. However in reality we do not observe this, similar countries in terms of technology or factor endowments do have different industrial structures.

The new economic geography suggests rather an inverse U-shaped pattern between trade costs and location of economic activity. When trade costs fall, economic activity will agglomerate into one or a few countries or regions (Krugman 1991a). But when trade costs are very low, this is complete integration, firms will be dispersed further across countries and regions (Fujita et al. 1999). Note that agglomeration and specialization are not the same. While the term agglomeration refers to the location of all economic activity, specialization is the extent to which a country specializes its activities in a small number of industries (De Bruyne 2004).

More recent theories on industrial specialization are developed by Bernard et al. (2004) and Imbs & Wacziarg (2003). Bernard et al. (2004) set up a model of comparative advantage theory with heterogeneous firms and find that opening to trade will increase the probability of exporting in comparative advantage industries more as Neo-Classical trade theory predicts. On the other hand Imbs & Wacziarg (2003) explain that the specialization pattern of a country depends on the development level of the country. Poor countries tend to diversify to reduce the risk of a sector-specific shock, but when the countries have grown to high levels of income per capita they specialize.

On the empirical side there seems to be a tendency of increasing specialization in Europe (Amiti 1999), (Brulhart 1998). Also specialization patterns in Central and East Europe have been studied recently. Traistaru et al. (2003) find that economic integration leads to higher regional specialization in 5 Eastern European countries[1] during the period 1990-1999. Also Hildebrandt & Worz (2004) confirm for 8 Central and East European countries[2] that they became more specialized during the period 1993-2000. One drawback of these specialization studies is that they use specialization measures based on employment data and capture economic integration by a time trend.

Our paper extends the literature empirically on several fronts. First we use the Beine & Coulombe (2004) method for 13 Central and Eastern European countries[3]. This dynamic method uses the degree of trade weighted tariffs to

[1] Bulgaria, Romania, Hungary, Estonia and Slovenia

[2] Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic and Slovenia

[3] Bulgaria, Lithuania, Cyprus, Slovakia, Latvia, Romania, Hungary, Turkey, Estonia, Czech Republic, Malta, Poland, Slovenia

capture the economic integration rather than a linear time trend. Further they look at the short and long run effects of trade integration. Second, we complement the trade weighted tariffs measure by complementary measures of trade integration such as index of hidden barriers and quotas and economic freedom index. This allows to capturing the trade integration at stake between the EU and the Eastern European countries in a more accurate way. And finally, we also study the relation between the industrial structure of these countries and the transition process.

3 Data

3.1 Industrial Specialization

As done by many authors in this empirical literature (Sapir 1996), we measure the degree of absolute industrial specialization of 13 Central and East European countries by the Herfindahl index.[4] The evolution of the Herfindahl index might reveal to what extent a given country is becoming more specialized or diversified, regardless of how the economic structures of other countries are evolving. The Herfindahl index is one indicator of the second moment in the distribution of the export intensities across sectors. More precisely, it measures to what extent the distribution of export shares differs from a uniform distribution. It is also suited for international comparisons, which is important given our panel data strategy. The Herfindahl is computed for each country i and each year t as the sum of squared export shares over all industries within one country.

$$S_{i,t} = \sum_{k=1}^{J} (s_{i,t}^k)^2, \tag{1}$$

where $s_{i,t}^k = x_{i,t}^k / \sum_{k=1}^{J} x_{i,t}^k$

The higher this index, the more specialized the country is. To construct the Herfindahl indices we use yearly import flows from the European Union to 13 individual countries of Central and East Europe on the HS 8-digit[5] product level from *Eurostat* for the period 1989-2000. Using a correspondence key, the data was translated at the Nace 4-digit industry level (250 industries). Note that we do not include the export to the rest of the world because the share of exports to the non EU countries is relatively small.

It is clear from Figure 2 that the average Herfindahl index has a decreasing trend since 1992 and increases slightly for the most recent years. This indicates that on average Central and East Europe specialized during the transition process.

[4]We investigate here the degree of the so-called absolute specialization, i.e. the extent to what a given country of region is specialized in a limited number of activities. This concept of specialization directly relates to the concept of risk exposure. This contrast with relative specialization which measures to what extent the export or production structure differs from those of the other (contingent) countries or regions. This latter notion of specialization is often measured by the K-spec index and might be used as an indicator of heterogenity of export or production structures within a given geographical area.

[5]The Harmonized system (HS) is an industrial classification system we use at the 8-digit product level

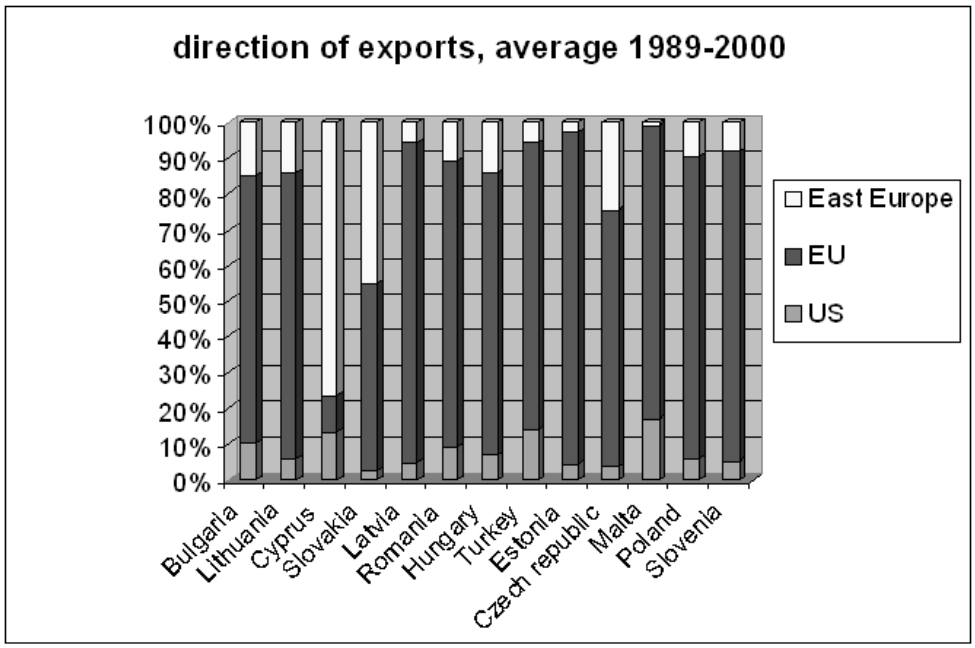

Figure 1: Direction of average exports from 1989-2000

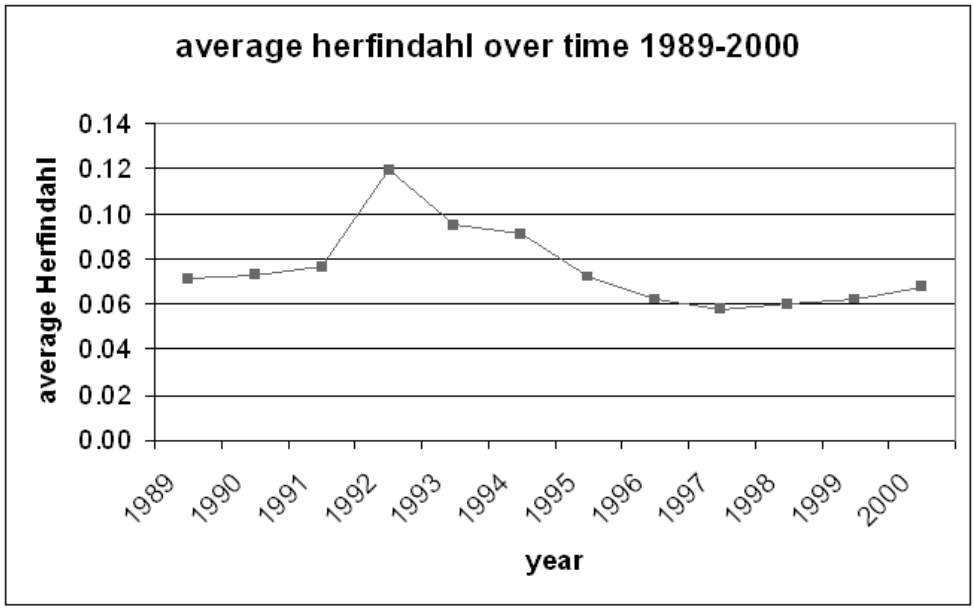

Figure 2: Average Herfindahl index over time

3.2 Trade Integration

Trade integration is captured by the trade weighted tariffs of the EU to individual Central and East European countries. We used yearly importing tariffs on the HS 8-digit level from the *John Haveman database*. These data are available from 1989 until 2000. We used the preferential rates of a product for individual Central and East European countries but when this was not available, we used the MFN (most favored nations) rates. The level of trade weighted tariff per country i at time t is calculated as follows:

$$TW_{i,t} = \sum_{k=1}^{J} w_{i,t}^{k} \tau_{t}^{k} \tag{2}$$

with the weight w equal to $exports_k^i / \sum_{k=1}^{J} exports_k^i$

Not all tariffs were available for all years, therefore we replaced the missing tariff at time t with the tariff value of time t+1.

Figure 3 shows that the average non-weighted tariff over all countries decreased over the period 1996-2000 and as a consequence of trade integration in Europe increased.

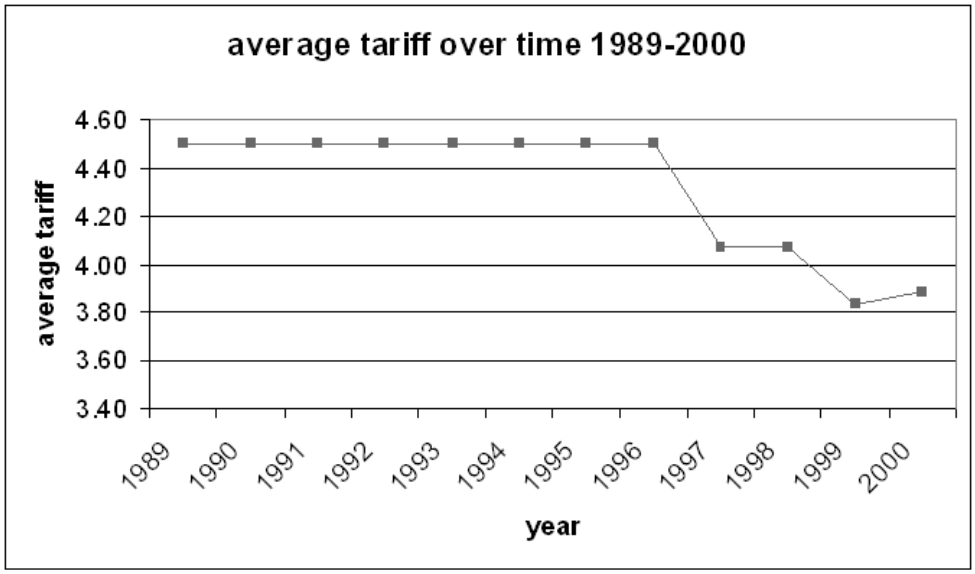

Figure 3: Average non-weighted tariff over time

We also control for the barriers other than published tariffs and quotas from the economic freedom index. This data is only available for the years 1990, 1995 and 2000. We complement these trade integration measures by an index of trade liberalization. The index is increasing with higher liberalization. Interestingly, while the trade weighted tariff index, the economic freedom index and the index of trade liberalization are all related to trade integration, they are loosely correlated. The (log) of the trade weighted tariffs is almost uncorrelated with the index based on import barriers (the correlation amounts to 0.006). It

is negatively correlated with the trade liberalization index but the correlation amounts only to -0.249. This suggests that the three indexes might be seen as complementary measures of trade integration and should be jointly included in the econometric model. [6]

3.3 Other Variables

Although Beine & Coulombe (2004) could not find any significant effect of other determinants of industrial specialization, we will control for the business cycle and institutions.

To control for every individual Central and East European country and the EU15 as a whole, we detrended the GDP data (*EBRD reports, IMF database*) for these countries with the Hodrick-Prescott filter. Maravall & del Rio (2001) and Pedersen (2001) suggest that the smoothing parameter of the filter should be between 6 and 14 for annual data. In this analysis, we used a value of 7 for the smoothing parameter.

Finally, we also include 4 variables that control for the transition process and institutions of the countries: index of enterprize reform, competition policy, price liberalization and infrastructure reform. A higher index indicates more reforms, policy or liberalization. This index drawn from the *EBRD reports* is only available for 10 East European countries (Hungary, Bulgaria, Romania, Czech Republic, Slovakia, Slovenia, Poland, Estonia, Latvia, Lithuania).

4 Methodology

In order to investigate the relationship between trade integration and specialization, we build on the approach proposed by Beine & Coulombe (2004) which relies on the estimation of a dynamic panel data model. The general idea of Beine & Coulombe (2004) is to overcome the issue of insufficient number of data points faced in a pure time-series approach through the combination of cross-section and time-series data. Such an approach is called for here given that we can trace back to 1989 at best (using annual data). Combining these data for the thirteen Central and East European countries leads to a reasonable number of data points.

We estimate the following dynamic panel data model :

$$\Delta log(S_{i,t}) = \alpha_i + \delta_t + \phi_1 log(S_{i,t-1}) + \phi_2 log(TW_{i,t-1}) + \phi_3 \Delta log(TW_{i,t}) + \phi_4' Z_{i,t} + \epsilon_{i,t} \quad (3)$$

where α_i is an individual effect (fixed effect), δ_t are time effects, $Z_{i,t}$ is a vector of explanatory variables other than the trade weighted tariffs and $\epsilon_{i,t}$ is an error term. The dynamic feature of the model is important because it disentangles the short-run from the long-run effects of trade integration. The short-run is

[6] This contrasts with (Beine & Coulombe 2004) who argue that the trade weighted index captures most of the integration process between Canada and the US. This might reflect that in contrast to what happened in North America, tariffs decrease in Europe do not go along with decreases in non-tariff barriers.

captured by ϕ_3 while the long run is given by $-\frac{\phi_2}{\phi_1}$. The decomposition of the effect of trade integration between a short and a long-run component is important from both a theoretical and an empirical point of view. As for the theory, localization and backward-forward processes at stake in the new geographic economy theory obviously take time to show up. For instance, after an initial displacement of economic activity in response to a shock, agglomeration processes that will change the degree of specialization will take place in a gradual way. This suggests that the short-run effect in terms of specialization might differ from the long-run one. This conjecture is supported by the findings of Beine & Coulombe (2004) for Canadian provinces: they find that specialization tends to increase in the short run (say one year) while in the long-run (between 2,5 and 3 years), diversification is at stake.

The model is estimated with fixed individual and time effects to account for unobserved heterogeneity. Newey-West robust standard errors of parameter estimates are computed to account for residual serial correlation and heteroskedasticity. The Nickell bias (Nickell 1981) at stake in dynamic panel data is not explicitely accounted for by specific techniques such as GMM but given the relatively low number of cross-sections (compared to the number of time periods), this bias should be negligible.

5 Results

5.1 Benchmark regressions

Table 1 reports the estimation results relative to the benchmark regressions. Due to missing data for a couple of variables, these benchmark regressions includes variables for which we have a reasonable number of available data points. We will supplement these benchmark frameworks with additional variables such as the ones relative to the entreprise reforms, competition, trade liberalization (other than through the decrease in tariffs and import barriers), infrastructure and price liberalization. Including these variables would ideally be called for in the initial regression, but this would lead us to use a low number of data points. For this reason, these will be used as a robustness check (see section (5.2.2)).

On the whole, the fit of the dynamic panel data model to the data seems rather good. The estimated speed of adjustment of the Herfindahl index to a shock amounts to something between 2.2 and 2.4 years depending on the regressions. This is in line with the results obtained by Beine & Coulombe (2004) for Canadian manufacturing exports. The results are robust to the inclusion of time specific effects, as suggested by comparisons between the results obtained in regressions (1), (3) and (4) with those of regression (2) (obtained with time dummies included). This is important because this suggests that our results regarding the impact of integration are not driven by time trends common to all countries observed in the evolution of the degree of export specialization.

Coming to the impact of integration, we find very robust results in favor of a long-run relationship between specialization and trade integration captured by the decrease in tariffs. The long-run relationship is negative, suggesting that the decrease in tariffs has led to a long-run increase in the degree of export

Table 1: Impact on export specialization for 13 CEEC countries

	(1)	(2)	(3)	(4)
Constant	-1.16	-1.47***	-1.43***	-1.28***
	(6.62)	(0.61)	(0.36)	(0.63)
$log(S_{i,t-1})$	-0.44***	-0.45***	-0.42***	-0.42***
	(0.08)	(0.09)	(0.08)	(0.08)
$log(TW_{i,t-1})$	-0.54***	-0.49***	-0.52***	-0.56***
	(0.15)	(0.14)	(0.14)	(0.15)
$\Delta log(TW_{i,t})$	-0.18	-0.12	-0.19	-0.49*
	(0.13)	(0.13)	(0.13)	(0.25)
national business cycles	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
EU business cycle	0.00***	0.00***	0.00***	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
import barriers	-0.03	-	-	-
	(0.87)			
$(\Delta log(TW_{i,t}))^2$	-	-	-	0.28
				(0.20)
$Nobs$	114	101	121	114
$pvalue(F-stat)$	0.00	0.00	0.00	0.00
R^2	0.08	0.12	0.08	0.09

Estimated model:$\Delta log(S_{i,t}) = \alpha_i + \delta_t + \phi_1 log(S_{i,t-1}) + \phi_2 log(TW_{i,t-1}) + \phi_3 \Delta log(TW_{i,t}) + \phi_4' Z_{i,t} + \epsilon_{i,t}$. Robust standard errors of estimates are in parentheses. All models include fixed individual effects. Time effects only included in regression(2) as these turn out to be insignificantly different from zero. Individual effects and time effects not reported to save place.***, ** and * denote significance level of estimates at respectively 10, 5 and 1 percent levels.

specialization. This result is supportive of trade theories based on the new economic geography approach suggesting that trade integration leads to a long-run concentration of activities across regions and across sectors. Using quite a similar approach, Beine & Coulombe (2004) obtain the opposite result on Canadian data. This suggests that the relationship between integration and industrial specialization is not monotonic and that its nature might depend on the level of economic development[7].

We do not find any robust short-run impact of integration. Our measure of import barriers does not suggest any additional effect of trade integration. Out of the control variables introduced in these benchmark regressions, only the European business cycle variable tends to yields significant impact on specialization, suggesting that CEEC countries tend to specialize their exports when the EU is booming. To account for possible non-linear relationships between tariffs and specialization, regression model (4) also includes the square of the trade weighed tariffs. The results do not support this type of functional form.

5.2 Robustness checks

In order to assess the degree of robustness of our benchmark regression results, we extend the analysis in two different directions. First, we look at the issue of the missing values for the tariffs drawn from the *Haveman* database. Second, we include other potential control variables, but at the expense of a lower number of observations.

5.2.1 Missing values

As explained in section3, there are a significant number of missing values in the *Haveman* database from which our tariffs data are drawn. [8] In the previous analysis, the gaps in the data were filled in using the $t+1$ value observed for each country. The implicit assumption is that we should apply the most recent value available to the data. We investigate here the degree of robustness of our results with respect to this assumption. To this aim, we fill in the missing value using the $t-1$ value, assuming that the tariff does not change until the time of the first next available value. The results are reported in column (1) of Table 2.

These results are very in line with those obtained in the benchmark regressions (table 1). They support the findings of a long-run impact of integration in terms of export specialization. Furthermore the results are found to be robust to the exclusion of data observed in 2000 (for which there is some uncertainty regarding the reliability)and to the exclusion of Cyprus (because Cyprus exports mainly to Eastern Europe, see Figure1).

[7] One possible reason for the different nature of the integration-specialization relationship between industrialized and transition countries might depend the availability of human and physical capital. With relatively high levels of both physical and human capital levels like in Canada, backward-forward linkages can work and further diversification of activities might be possible to take place. In contrast, if capital is constrained, diversifying might be impossible even when it is profitable.

[8] This is hardly surprising given the low level of data availability, even for industrialized countries (Anderson & Wincoop 2004).

Table 2: Robustness check: missing tariffs data

	(1)	(2)	(3)
$Constant$	-2.03***	-1.16**	-1.60***
	(0.998)	(6.62)	(0.57)
$log(S_{i,t-1})$	-0.63***	-0.44***	-0.41***
	(0.15)	(0.08)	(0.08)
$log(TW_{i,t-1})$	-0.56***	-0.54***	-0.46***
	(0.18)	(0.15)	(0.14)
$\Delta log(TW_{i,t})$	-0.37***	-0.18	-0.17
	(0.14)	(0.13)	(0.13)
national business cycles	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
EU business cycle	0.00	0.00	0.00*
	(0.00)	(0.00)	(0.00)
import barriers	-	-0.03	-
		(0.87)	
$Nobs$	53	108	112
$pvalue(F-stat)$	0.00	0.00	0.00
R^2	0.19	0.09	0.11

Estimated model:$\Delta log(S_{i,t}) = \alpha_i + \delta_t + \phi_1 log(S_{i,t-1}) + \phi_2 log(TW_{i,t-1}) + \phi_3 \Delta log(TW_{i,t}) + \phi_4' Z_{i,t} + \epsilon_{i,t}$. Robust standard errors of estimates are in parentheses. All models include fixed individual and time effects. Individual effects and time effects not reported to save place. The missing data in regression (1) are filled in using the $t+1$ values. The missing data in regression (2) and (3) are filled in using the $t+1$ (available) values (see main core of the text for further explanations). Regression (2) does not include the year 2000. Regression (3) excludes Cyprus. ***, ** and * denote significance level of estimates at respectively 10, 5 and 1 percent levels.

5.2.2 Other control variables

As another robustness check, we increase the number of the $Z_{i,t}$ variables in specification (3) and check the impact on the results with respect of the trade-specialization relationship. Unfortunately, given the high number of missing data for the CEEC countries, the inclusion of these additional controls reduces the number of usable data points, which in turn lowers the quality of the statistical inference procedure. Furthermore, these variables are not available for the entire sample of countries. 3 countries are excluded from the regression sample used in this robustness analysis: Malta, Cyprus and Turkey. Therefore, these results might differ from those of the benchmark regressions not only through an omitted variable effect but also through a sample specific effect.

Table 3 report the results. 3 comments are in order. First and importantly, the long-run effect of trade integration as captured by the trade weighted tariffs remain robust with respect to the previous regression results. It is negative and highly significant, suggesting that trade integration leads to more specialization. In contrast, the short-run impact is much less robust and should therefore be taken with cautious. Second, the index relative to the trade liberalization does not seem to be associated much with changes in the export specialization structure. This suggests that the impact of economic integration is captured mainly by the decrease in the trade weighted tariffs. Finally, out of the five additional variables thought to affect the dynamics of specialization, only the enterprise reforms variable seems to exert a significant impact. We leave the explanation of this result to future research on the evolution of export structures in transition economies.

6 Conclusion

This paper studies the impact of trade integration on the degree of industrial specialization in thirteen countries of Central and Eastern Europe during the period 1989-2000. To investigate this effect we build on a previous method proposed by (Beine & Coulombe 2004). In stead of a pure time-series approach they use the degree of trade weighted tariffs to capture economic integration. Although they find short-run specialization and long-run diversification for Canada. Our results show that trade integration leads to long-run industrial specialization in the CEEC countries. We interpret the different results as evidence that industrial specialization depends on the degree of development of the country or region. Considering the (future) enlargement of the European Union, the evolution of specialization of the CEEC countries is important because it reflects the exposure of the countries to important sectorial shocks. Furthermore we find that CEEC countries tend to specialize their exports when the EU is booming. And more interesting is that the entreprise reforms during the transition period in the CEEC countries stimulate the export specialization.

Table 3: Robustness check: additional control data

	(1)	(2)	(3)	(4)
Constant	-1.48***	-1.24	-1.24	-0.15
	(0.46)	(0.83)	(0.82)	(9.5)
$log(S_{i,t-1})$	-0.49***	-0.51***	-0.51***	-0.44***
	(0.09)	(0.11)	(0.11)	(0.13)
$log(TW_{i,t-1})$	-0.92***	-1.01***	-0.98***	-0.73***
	(0.26)	(0.26)	(0.28)	(0.26)
$\Delta log(TW_{i,t})$	-0.44	-0.54*	-0.53*	-0.10
	(0.31)	(0.32)	(0.32)	(0.16)
national business cycles	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
EU business cycle	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
import barriers	-	-	-	-0.11
				(1.25)
entreprise reforms	0.40***	0.42***	0.44***	-
	(0.11)	(0.11)	(0.12)	-
competition	-0.07	-0.15	-0.14	-
	(0.16)	(0.18)	(0.18)	-
infrastructure	0.00	-0.01	0.00	-
	(0.13)	(0.15)	(0.15)	-
price liberalization	0.02	-0.02	-0.01	-
	(0.06)	(0.06)	(0.08)	-
trade liberalization	-0.03	0.03	-	0.14*
	(0.06)	(0.06)	-	(0.08)
$Nobs$	68	68	68	75
$pvalue(F-stat)$	0.00	0.00	0.00	0.01
R^2	0.06	0.07	0.07	0.05

Estimated model:$\Delta log(S_{i,t}) = \alpha_i + \delta_t + \phi_1 log(S_{i,t-1}) + \phi_2 log(TW_{i,t-1}) + \phi_3 \Delta log(TW_{i,t}) + \phi_4' Z_{i,t} + \epsilon_{i,t}$. Robust standard errors of estimates are in parentheses. All models include fixed individual and time effects are included in columns (2) and (3) only. Individual effects and time effects not reported to save place. ***, ** and * denote significance level of estimates at respectively 10, 5 and 1 percent levels.

References

Amiti, M. (1999). Specialization patterns in europe. *Weltwirtschaftliches Archiv*, 134(4), pp 573.

Anderson, J. & Wincoop, E. (2004). Trade costs. *Journal of economic literature*, 42(3), pp 691.

Beine, M. & Coulombe, S. (2004). Economic integration and regional industrial specialization:evidence from the canadian-us fta experience. , .

Bernard, A., Redding, S. & Schott, P. (2004). Comparative advantage and heterogeneous firms. *NBER working paper*, (10668).

Brulhart, M. (1998). Economic geography, industry location and trade: the evidence. *World Economy*, 21(6), pp 775.

De Bruyne, K. (2004). *Essays in the location of economic activity*. doctoral dissertation. KULeuven.

Fujita, M., Krugman, P. & Venables, T. (1999). *The spatial economy: cities, regions and international trade*. MIT Press, Cambridge.

Hildebrandt & Worz (2004). Determinants of industrial location patterns in ceecs. *wiiw working paper*, .

Imbs, J. & Wacziarg, R. (2003). Stages of diversification. *The American Economic Review*, 93(1), pp 63.

Krugman, P. (1991a). *Geography and trade*. MIT University Press, Cambridge.

Krugman, P. (1991b). Increasing returns and economic geography. *Journal of political economy*, 99.

Krugman, P. (1993). Lessons of massachusetts for emu. , .

Maravall, A. & del Rio, A. (2001). Time aggregation and the hodrick-prescott filter. *Banco de Espana*, .

Nickell, S. (1981). Bias in dynamic panel data models with fixed effects. *Econometrica*, 49.

Pedersen, T. M. (2001). The hodrick-prescott filter, the slutzky effect, and the distortionary effect of filters. *journal of economic dynamics and control*, 25.

Sapir (1996). The effects of europe's internal market programme on production and trade: a first assessment. *weltwirtschaftliches Archiv*, 132, pp 457.

Traistaru, I., Nijkamp, P. & Longhi, S. (2003). Determinants of manufacturing location in eu accession countries. , ERSA 2003 Congress.