Does Monetary Integration Have an Effect EU's Trade Change During Economic Crises?

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1. Introduction

Measuring trade benefits stemming from monetary integration is still an important area to explore. The fundamental question that EU countries should ask before taking the decision to participate in the monetary integration concerns the benefits of joining the Eurozone. Do these benefits outweigh those of being just a member of the EU? Is it worth to speed up the economic integration process? Baldwin [2006, page XVI] writes:

> **Greater exports are a political economy "prize" that should ease the political "sacrifice" on the stabilization side.**

Following Baldwin, it is assumed that increasing export is the main benefit. What has to be done, then, is to verify whether this increase is more important for those EU countries that are members of the Eurozone than for those that are not.

In the present article a gravity model based on a set of panel data will be constructed. A single observation in this panel is constituted of a pair of countries observed over a one year period. This allows for formulating the dependent variable as the volume of export from one of the countries in a given pair (exporter) to the other (importer). The data used in this analysis covers the 1994–2010 period. That means that the crisis period is partly included in the analyzed data range. The problem is, however, that there may have been a structural break at the beginning of the global crisis and possibly also the following later, which would reflect the varying intensity of the crisis over the years. That is why some products of particular independent variables with dummy variables for the years 2009 and 2010 have been introduced, which allows for structural breaks in the modeled relationship.

The bilateral intra-EZ trade used to grow at a slower pace than the trade between other EU countries. Figure 1 shows how bilateral trade flows of EU countries evolved from 1999 onwards. The dynamics of exports between EZ countries, between EU countries, and between the EZ and the rest of the world (1999 = 100) has been demonstrated. Data shows that, from the beginning of monetary integration, the rise in intra-EZ trade was smaller than in each of the other cases. Also, the reaction during the time of economic crisis was more significant for the EZ countries.

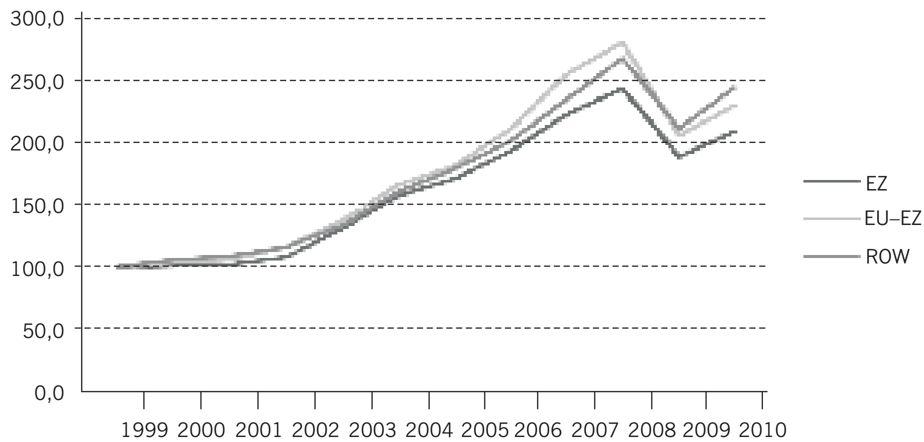

Figure 1.

Export dynamics of European Union (EU), Eurozone (EZ) and the rest of the world (ROW) countries, 1999 = 100

Source: UNCTAD database, http://www.unctad.org

That confirms that intra-EZ and extra-EZ trade processes should be analyzed differently and a proper model should take into consideration the fact whether a given reporter or partner is or is not a member of a trade union of a given type.

This paper is structured in the following way: introduction will be followed by section 2 where selected theoretical issues regarding the model and the method of estimation will be discussed. A description of the dataset can be found in Section 3. An empirical analysis as well as a brief overview of the results will be given in section 4. Section 5 covers concluding remarks.

The estimation results shown in the article have been obtained with the use of Stata 12 software.

2. Impact on trade—theoretical background

In the traditional version of gravity model, the value of export is a function of bilateral trade for a pair of countries, their GDPs and the distance between them:

$$\ln X_{ij}^{t} = \beta_0 + \beta_1 \ln\left(GDP_i^t\right) + \beta_2 \ln\left(GDP_j^t\right) + \beta_1 \ln\left|GDPpc_i^t - GDPpc_j^t\right| + \\ + \beta_4 \ln dist_{ij} + \varepsilon_{ij}^t \quad (1)$$

X_{ij}^{t}—exports from country i do j, time t,
GDP_i^t—nominal GDP of country i,
GDP_j^t—nominal GDP of country j,
$\left|GDPpc_i^t - GDPpc_j^t\right|$—difference of GDP per capita between i and j,
$dist_{ij}$—distance between country i and j.

Recently researchers [Anderson, 1979; Bergstrand, 1985; Helpman and Krugman, 1985; Deardoff, 1994; Anderson and van Wincoop, 2003; Eaton and Kortum, 2001] have demonstrated that the gravity equation can be derived from a variety of theoretical models based on neoclassical or monopolistic competition approaches for homogenous and differentiated goods. This has increased the number of applications for gravity models, including estimations of monetary integration effects. Not much theoretical work has been done on monetary integration in which dummy variables were used in gravity models; nonetheless, these have been applied by various researchers (beginning with the first work of Rose [2000]).

Research on trade effects of the EMU can be divided into pre-EMU and post-EMU literature. A critical and synthetic review of their stand in empirical works is presented by Baldwin [2006]. The first expectations regarding the EMU trade effects are mainly based on a study by Rose [2000]. His analysis covers 186 countries and contains more than 300 cases of pairs of trade partners sharing the same currency. In Rose's opinion, after World War II, the existence of currency unions led to an increase in trade by 200%. Rose repeated his analysis (see, among others, Frankel and Rose, 2000; Rose and Wincoop, 2001) which confirmed the general result obtained in the pioneering work. However, the level of trade intensification was lower than expected after the first research. The most important reason was the positive impact of elimination of exchange rates on bilateral trade (elimination of exchange rates volatility and simultaneous decrease in transaction costs covered by trading firms). In the long run, the common currency helps to deepen economic integration, which is a source of further benefits.

Rose's work initiated the discussion about the EMU's impact on trade. It also provoked a lot of criticism. Persson [2001] was the first to object to the magnitude and measuring of the Rose effect. Also Baldwin [2006] reviews Rose's work and the follow-up papers and specifically points his critique at the possible estimation biases related to the omitted variables, endogeneity and sample selection.

After the Eurozone had been created there have been a large number of papers aimed at a verification of the Rose effect on the EMU. In the first study, Micco, Stein and Ordonez [2003] estimated a 6% expected increase in trade among the EMU countries compared to trade among other EU members. The data from 1992 to 2002 on the EU15 sample was used to estimate a model with pair fixed effects. Other authors used different econometric methods (most of them were based on panel data with fixed and random effect techniques) and received positive and significant impact of the EMU on trade. Berger and Nitsch [2005] re-estimated MSO adding a fifth year of data. They showed that implementing control for the general trend of greater economic integration among Eurozone countries makes the euro effect disappear. Flam and Nordstrom [2003] estimated the Rose effects at 9%. Belke and Spies [2008] applied the Hausman-Taylor instrumental variables estimator and found a 7% euro effect.

The research work reviewed above is based on panel data and so is this study. An extended gravity model based on a panel in which each unit is a pair of countries while each period is one year is constructed in this paper. Some older studies suggest estimating panel-data-based models in this field with OLS. This, however, would mean imposing a number of strict assumptions. For example, it is assumed that there is no autocorrelation of the error term. This implies that there is no directly unobservable time-constant characteristic for each pair of countries which would make their trade relationship stronger (or weaker) than one could establish just by analyzing the values of independent variables in the model constructed. This is certainly not the case: one could think of a number of country pairs which would not give "typical" results in this respect. For example, Germany and Austria or the Czech Republic and Slovakia would be expected to have a much stronger trade relationship than North and South Korea even if all of the independent variables were held constant in each of the three pairs. This suggests extending the model by introducing individual effects, which in this case stand for a-pair-of-countries effect, yielding a one-way model found in a number of works devoted to gravity models, already mentioned in the previous section. In most applications, those individual effects are treated either as "fixed" or as "random". This is crucial, since both the assumptions made in either case and the limitations of constructed models vary significantly. What treating individual effects as fixed means is that strict exogeneity of independent variables and no correlation between individual effects and the error term is assumed. The drawback of the fixed effects approach is that it is not possible to include any time constant independent variables in the model, which does not allow the inclusion of, for example, geographic distance between countries that constitute a pair. On the other hand, treating individual effects as random allows time-constant variables to be included, but this requires additionally the assumption of zero correlation between independent variables and individual effects. However, as an example one should take into account that in most cases neighbouring countries will be strongly related to one another in the sense of frequent contacts between enterpreneurs, closer contacts of their industries and so on. This "stronger relationship" is likely to mean a higher than average value of individual effects, which affects export (the dependent variable) but such an individual effect is thus also correlated with the distance between the two countries in the pair under consideration. Thus the assumption of zero correlation between individual effects and independent variables cannot hold.

One solution which allows for both, including time-constant variables in the model and allowing for correlation of individual effects and independent variables is the estimator of Hausman and Taylor [1981], already used in several papers devoted to gravity models [Belke and Spies, 2008; Cieślik, Michałek and Mycielski, 2008]. Their method is based on estimating parameters standing by the time varying variables with the use of fixed effects estimator[1] first, and then using the instrumental variables method to estimate parameters standing by the time invariant variables. In the latter step the variables that are uncorrelated with individual effects are used as instruments and it is a sole decision of the researcher which of the independent variables can be assumed to be uncorrelated with individual effects. Usually this decision is based upon economic theory.

There is one difficulty that should be mentioned, though. Applying the Hausman-Taylor estimator allows independent variables to be correlated with individual effects[2], but does not allow for a correlation of independent variables and the error term. In this respect they are assumed to be exogeneous, which is a truly strong assumption. Theoretically, one could quite easily estimate a model with the use of instrumental variables estimator and in this way getting rid of this drawback. However, this would require following a procedure in which (a) a particular independent variable is assumed to be endogeneous and others to be exogeneous in the sense of correlation with the error term, (b) valid instruments are found and used for the endogeneous variables. Whereas the first step is not problematic (even if too many variables are assumed to be endogeneous, while they are in fact exogeneous, we only lose some efficiency, but the estimator itself remains consistent), the second step is crucial. In many cases it is very difficult to propose valid instruments, because these need to be both uncorrelated with the error term and strongly correlated with the endogeneous variables, which is difficult (if not impossible) to attain in macroeconomic modeling. If the first requirement is not fulfilled, the instrumental variable estimator is no longer a consistent one, while if the second one is not fulfilled—the estimator is at least highly inefficient. Egger [2002] argues that in applied literature no adequate instruments are proposed and the solutions that use instrumental vari-

[1] In a more efficient version of the estimator, this is in most cases slightly modified with the use of the instrumental variables method, however the logic remains unchanged.

[2] Not all of them can be correlated with individual effects, because there would be no instruments in that case. Technically speaking, the number of time invariant variables that are correlated with individual effects cannot be higher than the number of time varying variables assumed to be uncorrelated with individual effects. However, in this case this limitation is not a bottleneck.

ables in gravity models are not at all better than the "classical" ones. Indeed, it seems particularly difficult to propose valid instruments for which data are available and trustworthy. Therefore, the authors follow most researchers and assume exogeneity of the independent variables with respect to the error term limiting the endogeneity problems to possible correlation with individual effects.

The last remark on the functional form of the model concerns the differences between particular periods. It is quite popular to include linear (or nonlinear) trend in the model. The reason for this is the fact that one could expect the phenomenon of interest to change autonomically over time. Still, the type of trend function included in the model reflects mostly the authors' expectations or experience regarding a "proper" functional form of the time factor. Having a set of panel data with many observations allows for greater flexibility: autonomic changes over time without imposing any parametric assumptions can be introduced. This is done by including time effects in the model, which transforms the specification to a two-way model. Time effects are treated as fixed, which actually means including a set of dummy variables for particular years in the set of independent variables and in this case requires no changes of the estimation method and further changes of the model.

The model can be schematically written as:

$$\ln EXPORT_{ij}^{t} = \beta_0 + \left(x_{ij}^{t}\right)\beta + \alpha_{ij} + \lambda^{t} + \varepsilon_{ij}^{t} \quad (2)$$

where:
x_{ij}^{t} is a vector of independent variables for a pair of i-th country (reporter) and j-th country (partner) in year t (including variables typically included in gravity models and further variables discussed in the next section),
α_{ij} is an individual effect in the pair of i-th country and j-th country,
λ^{t} is a time effect for all pairs of countries in year t,
ε_{ij}^{t} is an error term for a pair of i-th country and j-th country in year t.

This general model, estimated with the use of the Hausman-Taylor estimator is further discussed and explored in the next section.

3. Variables and data used

In the previous section the general gravity model was mentioned. Its many versions can be found in related literature. However, in order to answer the research questions, a number of additional independent variables have been introduced. A complete list of variables used in the model is presented in the Table 1.

The pairs of countries in which one of the countries is a former colony of the other one have been omitted. This is because on the one hand, this factor could be relevant and should be included in the model in order to eliminate a potential omitted variable bias, but on the other hand, there is a risk that the process itself in such pairs of countries differs substantially from the one observed in the other case. One solution is thus to eliminate such observations.

Table 1.

Variables used in the model

Variable Name	Description	Source	Expected sign
lgdpi	Natural logarithm of GDP in current US dollars of reporter country (country 1) representing the country size variable	WDI	+
lgdpj	Natural logarithm of GDP in current US dollars of partner country (country 2) representing the country size variable	WDI	+
ddgppc	Natural logarithm of the absolute value of difference of GDP per capita in purchasing power parity (PPP) of reporter and partner countries as a measure of the impact of factor proportions on bilateral trade	WDI	–
ldist	Natural logarithm of geographic distance between trading country pairs as a measure of the impact of trade costs.	CEPII	–
EUEU	Dummy variable indicating that the reporter country joins the EU but *not* ERM or Eurozone while the partner country is an EU member but is *not* a member of the ERM or the Eurozone. This variable controls the impact of joining the EU on exports to the EU partner country.		+
ERMEU	Dummy variable indicating that the reporter country joins the ERM but *not* the Eurozone while the partner country is an EU member but is *not* a member of the ERM or the Eurozone. This variable controls the impact of joining the ERM by the reporter country on exports to the EU partner country.	ECB	+
EuroEU	Dummy variable indicating that the reporter country joins the Eurozone while the partner country is an EU member but is *not* a member of the ERM or the Eurozone. This variable controls the impact of joining the Eurozone by an ERM country on exports to the EU partner country.	ECB	+
EUERM	Dummy variable indicating that the reporter country joins the EU but *not* ERM or Eurozone while the partner country is an EU member but is *not* a member of the Eurozone. This variable controls the impact of an ERM--country's joining the Eurozone on exports to a partner country that participates the in ERM.	ECB	+
ERMERM	Dummy variable indicating that the reporter country from the EU enters the ERM but *not* the Eurozone while the partner country is an ERM member but is *not* a member of the Eurozone. This variable controls the impact of joining the ERM by an EU member country on exports to a partner country that participates in the ERM.	ECB	+
EuroERM	Dummy variable indicating that the reporter country, a member of the ERM joins the Eurozone while the partner country is an ERM member but is *no*t a member of the Eurozone. This variable controls the impact of joining the Eurozone by a country participating in the ERM on exports to a partner country that participates in the ERM.	ECB	+
EUEuro	Dummy variable indicating that the reporter country joins the EU but not the ERM or the Eurozone while the partner country is a Eurozone member. This variable controls the impact of joining the EU on exports to a partner country from the Eurozone.	ECB	+

Variable Name	Description	Source	Expected sign
ERMEuro	Dummy variable indicating that the reporter country from the EU enters the ERM but *not* the Eurozone while the partner country is a Eurozone member. This variable controls the impact of joining EU on exports to a partner country from the Eurozone.	ECB	+
EuroEuro	Dummy variable indicating that the reporter country, a member of the ERM joins the Eurozone while the partner country is a Eurozone member. This variable controls the impact of joining the EU on exports to a partner country from the Eurozone.	ECB	+
EUout	Dummy variable indicating that the reporter country is a member of the EU while the partner country is not.		+
outEU	Dummy variable indicating that the partner country is a member of the EU while the reporter country is not.		+
lang	Dummy variable indicating that the reporter and partner countries share official language	CEPII	+
rta	Dummy variable indicating that the reporter and partner countries have singed regional trade agreement (RTA)		
cr_2009	Dummy variable indicating year 2009		–
cr_2010	Dummy variable indicating year 2010		–
cr_xxx_9	Interaction (product) of variable xxx with cr_2009		–
cr_xxx_10	Interaction (product) of variable xxx with cr_2010		

Source: own analysis.

An important issue when using the Hausman-Taylor estimator is, which of the variables included in the model are to be considered endogeneous in the sense of possible correlation with individual effects. A single observation in the panel is a pair of countries, so the individual effect can be treated as representing the "propensity" of the two countries to carry on more or less intensive export. That is why the natural logarithm of the absolute value of the difference of GDP per capita between the reporter and partner countries and natural logarithm of geographic distance between the trading country pairs are assumed to be endogenous (in the sense of correlation with individual effects). The difference of GDP per capita represents the impact of factor proportions on bilateral trade. The more similarity between the countries, the smaller the difference between them and, by the same token, the more intense cooperation should be expected. The geographic distance represents trade costs that countries have to pay. The closer the economies are to one another, the greater the propensity of countries to trade should be due to lower costs. However, apart from lower trade costs, geographical proximity of two countries usually also makes the two countries close in terms of their culture and individual entrepreneurs' relationships. Similarly, the countries that are similar in terms of their level of economic development (measured by GDP per capita) are probably more likely to be willing to cooperate. These two factors *do* have additional impact on the volume of trade, which is included as a part of the individual effects. Those individual effects are thus likely to be correlated with the GDP and geographical distances and this is why the Hausman-Taylor approach is adopted. It should be emphasized that this *correlation* does not mean *colinearity* and the individual effects should not be just removed from the model as they also cover the effects of the two countries that "like" (as for instance Cyprus and Greece) or "dislike" each other (as for instance North and South Korea).

4. Empirical results

Basing the research on the described set of panel data, the model presented in the last two sections has been estimated. Table 2 contains the results of estimation of the one-way model with instability during the crisis periods estimated with the use of the Hausman-Taylor estimator.

Table 2.
Results of the estimation

regressor	estimate (std. error)		regressor	estimate (std. error)
lgdpi	0.502***		y2009	–0.517*
	(0.0195)			(0.269)
cr_lgdpi_9	0.0303***		y2010	–0.982***
	(0.00771)			(0.299)
cr_lgdpi_10	0.0431***		rta	0.158***
	(0.00887)			(0.0231)
lgdpj	0.770***		EUEU	0.217*
	(0.0129)			(0.123)
cr_lgdpj_9	0.00965		EUERM	0.0437
	(0.00604)			(0.133)
cr_lgdpj_10	0.0267***		EUEuro	–0.0713
	(0.00666)			(0.186)
ddgppc	–0.0348***		ERMEU	0.511***
	(0.00976)			(0.121)
cr_ddgppc_9	–0.0697***		ERMERM	0.179*
	(0.00898)			(0.0984)
cr_ddgppc_10	–0.108***		ERMEuro	0.235
	(0.0102)			(0.186)
ldist	–1.539***		EuroERM	0.154**
	(0.504)			(0.0714)

regressor	estimate (std. error)		regressor	estimate (std. error)
cr_ldist_9	0.00832		EuroUE	0.214***
	(0.0159)			(0.0709)
cr_ldist_10	0.0220		EuroEuro	0.147
	(0.0178)			(0.0950)
lang	0.219		EUout	0.107***
	(0.322)			(0.0203)
cr_lang_9	–0.0515		outEU	0.0351
	(0.0372)			(0.0425)
cr_lang_10	–0.192***		constant	–9.986**
	(0.0424)			(4.367)

NT = 143,421; number of *ij* pairs = 14,305; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source: own calculations.

The products of particular independent variables with dummies for separate periods have been introduced for the years 2009 and 2010, which means that the 1994–2008 period should be seen as a reference period and the interpretation of non-interacted variables (the left side of the table) should be carried out for pre-crisis years. The products cr_xxx_9 and cr_xxx_10 represent the differences between the estimated influence of particular factors on the volume of trade in 2009 and 2010 respectively as compared to 1994–2008. The interacted variables are the typical ones that are included in most (if not all) gravity models. By contrast, estimates from the right-hand-side of table 2. are provided for the whole period analyzed, namely 1994–2010, and represent the average influence of particular factors on the volume of trade both before and during the crisis as it is assumed that there has been no structural break referring to the respective variables.

Beginning the analysis with the typical gravity model variables, it should be noticed that their assessed impact on the volume of trade corresponds well to the well recognized theory. In the pre-crisis periods, an increase in GDP of both the exporter and the importer in a pair of countries had a *ceteris paribus* positive influence on the expected trade, whereas the influence of their difference was significantly negative assuming any rational significance level. Similarly, the distance between countries constituting a pair (that could be treated as a proxy for transaction costs) had a negative impact on the expected export whereas no significant influence of the variable representing possession of a common language was found. The latter may be considered the only surprising effect, however not an astonishing one. Nowadays the fractions of populations that speak foreign languages are reaching a really high percentage and most companies that intend to participate in international trade can easily employ staff for whom communicating with foreign entrepreneurs is not a problem. Thus the role of a common language is diminishing and probably soon including this kind of variables will be of no use anymore. It is also suspected that the significance of the products of *lang* with dummy for 2010 should be attributed to the estimation error.

Following the estimates of parameters on particular products of the variables allows testing for structural breaks in the modeled relationship since their significance would mean that the relationship of interest changed during the crisis period. Such a situation occurs for most of them. It is the distance whose role seems to have been *ceteris paribus* the same throughout the considered period. However, this is not the case for any other of the considered factors. The role of the exporter's GDP and the difference between the GDP of the reporter and the partner changed both in 2009 and 2010. The estimates of the respective parameters allow us to spot that year by year their roles were increasing. As far as the importer's GDP is concerned, in the crucial year 2009 no difference between its influence on export as compared to previous years was assessed, however this was no longer the case in 2010 when the role of the partner's GDP in influencing the volume of trade was intensified. All these arguments suggest a clear conclusion that it is during crisis that most relationships become more black-and-white and the role of crucial factors intensifies. This conclusion seems obvious on a micro scale, however, it is the macro (country) level which actually results from a set of micro (company) level. One could suppose that it was the global decrease in the volume of trade in 2009 and 2010 that brought about the above conclusions, but that would not be true. In order to avoid such an effect, sole dummies were introduced for 2009 and 2010. The estimates of parameters on these two dummies are significantly negative corresponding to the decrease in the global volume of international trade in 2009 and 2010 and allowing for the above described interpretation of the estimates of parameters on particular products.

Interesting conclusions can be drawn from the estimates of parameters on dummies representing participation in the EU, ERM and Eurozone by either the reporter or partner. Firstly, it should be noticed that dummies have been introduced for almost every possible combination of "union situation" by both the reporter and partner except for one, which is when both of them are not members of the European Union. Such pairs of countries constitute a reference group and all the estimates of parameters on the EUEU-outEU (following their order in Table 2.) should be interpreted as reflecting the *ceteris paribus* difference between the average situation of a given pair of countries in terms of their participation in unions as compared to export in a pair of countries that are both not members of the European Union. For example, an estimate of the parameter on the EUERM variable represents the expected *ceteris paribus* relative difference of export value from an EU member to an ERM member compared to the value of export between two partners from outside the EU. These are given in Table 3.

Table 3.

Estimated *ceteris paribus* impact of the integration process on the volume of trade (% change)

reporter / partner	EU	ERM	Eurozone
EU	24.2	insignificant	insignificant
ERM	66.7	19.6	insignificant
Eurozone	23.9	16.6	insignificant

"Insignificant" stands for the lack of statistical significance up to the 10% level.
Source: own calculations on the basis of Table 2.

Figures in Table 3 should be understood in the following way: the expected volume of export in a pair of two EU countries was *ceteris paribus* by 24.2% higher in the analyzed period than in a pair of two non-EU countries (in the reference category). Similarly, the *ceteris paribus* expected volume of trade from an ERM country to an EU country was greater by about 66.7% than in a pair of two countries from outside the EU. The rest of the figures should be interpreted in the respective way.

A quick view on Table 3 clearly suggests that generally the intra-EU trade was greater than outside EU. A positive and statistically significant of the parameter on *EUout* confirms that as well: a ceteris paribus value of export to a non-EU country was greater in case of the exporters from inside than from outside the EU. However, the following step of integration did not have such a clear impact on the expected import. While joining the ERM had a positive impact on the expected export, becoming a member of the Eurozone was no more a stimulus for import increase. Although the situation of the Eurozone exporters was still on average better (as measured by the value of export) than in the case of the non-EU countries, it turns out to have been worse than in the case of the ERM members. The reduction of exchange rate variability is more significant for trade than monetary integration. This conclusion is clearly confirmed by pure statistical data: even the sole analysis of Figure 1. suggests that the trading situation of the Eurozone members was by no means better than the situation of the rest of Europe.

5. Concluding remarks

This paper has shown that there has been a structural break resulting in a change of relationship between classical gravity model variables and the volume of trade during the crisis period. It has been concluded that the previously clearly visible relationships during the crisis have become even more black and white and the influence of particular variables that are considered relevant became even more obvious during the global recession. The estimates of particular parameters of the model are quite trustworthy: a vast majority of them perfectly comply with the well-recognized theory standing behind gravity regressions.

Another conclusion that can be drawn refers to the changes in the expected volume of export from a country gradually tightening its cooperation with particular EU subgroups, first joining the EU, then the ERM and the Eurozone. The analysis shows that the situation of the EU members as a whole is *ceteris paribus* better in terms of export than that of non-EU countries. However, advancing to further steps of integration did not always result in increasing *ceteris paribus* export and the Eurozone members' situation was actually worse than of the sole ERM countries.

It is tempting to treat the latter conclusion as proving the existence of a causal relationship: joining the Eurozone has a negative impact on trade. Nevertheless, this is not a conclusion that could be drawn from the model analyzed even if it was actually true. It has to be noticed that the situation in the international market has recently been very difficult as a result of the global recession. It is a well-known fact that there are a few Eurozone countries which have suffered the most due to recent recession and the above mentioned conclusion may be affected by the fact that it is the collapse of a few Eurozone economies that provided such, probably partly spurious, estimate. This also suggests that confirming this result will most likely be possible in the medium or long run and will take a few more years in order to be confirmed or rejected.

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Abstract

Does Monetary Integration Have an Effect EU's Trade Change During Economic Crises?

This paper contributes to the discussion about economic effects of monetary integration and the problem of model stability during economic crisis. The fundamental goal of this research is twofold: firstly, to investigate the effect of different stages of economic integration on export to EU and non-EU countries, from becoming a member of the European Union (EU) to the Eurozone (EZ). Secondly, to check whether the functional form of the model can be considered stable over time as in the meantime the world entered the crisis phase. For an empirical test a data set covering the period from 1994 to 2010 has been used. The standard factors of gravity models, such as the size of the markets of trade partners, GDP per capita of trade partners etc. have been tested in the log-linear specification of the gravity model. In order to control the effect of monetary integration, several dummy variables indicating the process of monetary integration were added. Positive effects of growing GDP and GDP per capita, as usual, are expected. What is also assumed is that participation in a monetary union does not enhance exports to the EU and Eurozone countries. To test for this hypothesis, and to exercise control over additional factors, a model based on panel data with the use of Hausman-Taylor method was estimated. Surprisingly, it was found out that even though the impact of joining the EU and ERM on export has been positive, joining the Eurozone has given the opposite result. It will also be demonstrated that some of the parameters could be considered stable in the long run, but this is not relevant to all of them.

Keywords: international trade, monetary integration, gravity model
JEL code: F15, F10, F12