ISTITUTO DI STUDI E ANALISI ECONOMICA

TRADE POTENTIALS IN GRAVITY PANEL DATA MODELS

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ABSTRACT

In the last decade, a lot of effort has been produced in empirical international trade to explain bilateral volume of trade through the estimation of a gravity equation. A substantial share of this effort by scholars and Institutions regarded the estimate of trade potentials and the inference of trade effects of economic integration.

In this paper we show - for the former euro-zone countries trade flows - how the result of a gravity model in terms of potential trade changes introducing time invariant country-specific effects and dynamics.

In that case, our estimates give a more accurate account of the spread between actual and potential trade. Moreover, confronting the in-sample trade potential index derived from different estimators we give evidence of the convergence of the index towards the demarcation value corresponding to the equality between observed and predicted trade flows. Finally, we show how the sign of the index is not robust to a change of estimator, casting doubts on the soundness of strong policy implications based on the (in)existence of unrealized trade potentials.

JEL Classification Code: C13, C14, F10, F43

Keywords: International bilateral trade, Gravity model, Trade potentials, Dynamic Panel Data.

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SUMMARY

In the last decade, a lot of effort has been produced in empirical international trade to explain bilateral volume of trade through the estimation of a gravity equation. Because of its appeal as an empirical strategy, its application has became enormously popular. Among the many studies using the gravity framework, a high percentage shares the research or institutional task of predicting *trade potentials*. Those studies look for evidence of a trade enhancing effect of countries' integration, their aim being the prediction of the additional bilateral trade that might be expected if integration between two countries (or more than two countries) is fostered. The objective of these analyses has often not being limited to the quantification of the potential trade effect of integration and has frequently entered the domain of policy prescriptions. The advice of deeper integration or the inference of adjustment costs associated with further integration frequently relied on the measurements of trade potentials obtained from various specifications of the gravity model.

Along the years two main strategies have been selected in order to calculate trade potentials. The first one derives *out-of-sample* trade potential estimates, i.e. referring to the EU-CEECs literature, the parameters for EU (or OECD) countries are estimated by a gravity model and then the same coefficients are applied to project "natural" trade relations between EU countries and CEECs. The difference between the observed and predicted trade flows should represent the unexhausted trade potential. The second strategy derives *in-sample* trade potential estimates, i.e. CEECs are included in the regression analysis and the residuals of the estimated equation should represent the difference between potential and actual trade relations. In this work we are interested in this second type of calculation.

In spite of the strategy in use authors tend to associate strong conclusions from the sign of the difference between potential and effective trade flows. Our suggestion is to take these advises with a grain of salt, especially if the sign in the difference between effective and potential trade is not robust to the use of different estimators of the gravity model.

In order to verify the robustness of the sign of the difference between effective and potential trade we climb the staircase of panel data specifications of the gravity model, starting from a static linear equation, and moving subsequently to a static linear equation with fixed effects, and finally to a dynamic linear system with fixed effects.

We estimated an export equation for each of former 11 Eurozone countries to 32 importer countries (the 11 euro countries plus 21 other countries). We estimated the same functional form for all the 11 European countries in our sample, using subsequently all three different estimator.

There are two main pieces of evidence resulting from the analysis. First, when we estimate a gravity equation through a dynamic estimator instead of a static one, generally we obtain that the fitted value are more close to historical values. It follows that a potential trade index derived from a dynamic specification gives more accurate indications on the spread between actual and potential trade. Since the difference between the two could be interpreted as a sign of misspecification, one should be more confident in interpreting the difference between observed and in-sample predicted trade flows not as pure indication of the loose specification of the econometric model.

Secondly, the choice of the estimator (static or dynamic) is very important if we want to draw some policy guidelines from a gravity equation. The same “standard" gravity equation can give very different results in terms of potential trade index if we estimate it through a static estimator instead of a dynamic one.

In the large majority of the cases examined the potential trade changed sign according to the estimator used. In that cases, it would be improvident to draw any policy implication in terms of trade policy if the evidence of untapped trade potential or successful partnership is not robust to the use of different estimators.

IL COMMERCIO POTENZIALE NEI MODELLI GRAVITAZIONALI PANEL DATA

SINTESI

Nello scorso decennio, nella letteratura empirica si è ampiamente ricorso alla stima di equazioni gravitazionali per spiegare il volume di scambi bilaterali, in particolare per la valutazione del commercio potenziale e l'inferenza degli effetti commerciali del processo di integrazione economica.

In questo lavoro intendiamo mostrare come, relativamente ai flussi commerciali degli 11 paesi che hanno dato vita alla zona euro, i risultati di un modello gravitazionale, in termini di commercio potenziale, cambiano una volta introdotti elementi in grado di dar luogo ad una migliore specificazione, come le caratteristiche-paese e la dinamica.

In questo caso le nostre stime conducono a un più accurata descrizione della differenza tra commercio potenziale ed effettivo. Inoltre, confrontando l'indicatore di commercio potenziale calcolato sulla base di differenti metodologie di stima, si evidenzia una convergenza del valore di tale indicatore verso la soglia di demarcazione che corrisponde all'eguaglianza tra flussi di commercio osservati e stimati. Si mostra, infine, come il segno dell'indicatore non sia robusto al cambiamento dello stimatore; tutto ciò fa sorgere perplessità sulla solidità delle implicazioni di policy basate sulla esistenza di commercio potenziale non realizzato.

Classificazione JEL: C13, C14, F10, F43

Parole chiave: commercio bilaterale internazionale, modelli gravitazionali, commercio potenziale, modelli panel data dinamici.

CONTENTS

1. INTRODUCTION: GRAVITY AND TRADE POTENTIALS

In the last decade, a lot of effort has been produced in empirical international trade to explain bilateral volume of trade through the estimation of a gravity equation (Disdier and Head, 2003). As a reminiscence of Isaac Newton's law of gravity, the trade version of the latter represents a reduced form which comprise supply and demand factors (GDP or GNP and population), as well as trade resistance (geographical distance, as a proxy of transport costs and home bias) and trade preference factors (preferential trade agreements, common language, common borders).

Because of its appeal as an empirical strategy its application has became enormously popular. Quoting Eichengreen and Irwin (1997), the gravity model is nowadays "... the workhorse for empirical studies ..." in international trade. Since the early 1990s, the large availability of international data necessary to fill the standard specification of the model, the relative independence from (or ability to mirror) different theoretical models, and a bandwagoning effect made the gravity model *the* empirical model of trade flows (Evenett and Keller, 2002).

Among the many studies using the gravity framework, a high percentage shares the research or institutional task of predicting *trade potentials*.[1] Those studies look for evidence of a trade enhancing effect of countries' integration, their aim being the prediction of the additional bilateral trade that might be expected if integration between two countries (or more than two countries) is fostered. A different use of the gravity equation has been put forward by the U.S. Trade Commission (Rivera, 2003) to quantify the trade effects of liberalization.

After the fall of the Iron Curtain, gravity equations applications have been largely used to evaluate the trade potential of preferential agreements between the EU and the Central and Eastern European countries (CEECs) (Wang and Winters, 1992; Hamilton and Winters, 1992; Baldwin, 1994; Gros and Gonciarz, 1996; Brenton and Di Mauro, 1999; Nilsson 2000). The objective of these analyses has often not being limited to the quantification of the potential trade effect of integration and has frequently entered the domain of policy

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[1] The UNCTAD-WTO International Trade Centre (ITC) has recently developed a gravity model called *TradeSim* (International trade Centre 2003) with the main objective of estimating bilateral trade flows of Developing Countries with any of their partner countries. The model has been realized for supporting country member institutions, trade representatives and international institutions to assess actual trade potentials of countries with limited trade relations in the past. As an example, a previous version of *TradeSim* has been used by UNCTAD to estimate the impact of infrastructure on trade for several African countries (Unctad 1999).

prescriptions. The advice of deeper integration or the inference of adjustment costs associated with further integration[2] frequently relied on the measurements of trade potentials obtained from various specifications of the gravity model.

As far as the data structure is concerned, early empirical studies used cross-section data to estimate a gravity model, whereas in the most recent years, researchers use panel data. Both kind of analyses are mainly static and they refer to long run relationship.

In this paper our aim is to show how the results of a gravity model in terms of potential trade could vary to the introduction of elements aiming to reach a better specification. In particular, when we model our equation considering time invariant country-specific effects and dynamics, we obtain different indications about trade potentials with respect to that obtained from a static formulation of the gravity equation. We test our hypothesis estimating an export equation for 11 European countries in the euro-zone. Finally, we derive some conclusions about the exaggerated reports on trade potentials and the policy prescriptions associated to them.

2. RESEARCH QUESTIONS AND POLITICAL ANSWERS

Along the years two main strategies have been selected in order to calculate trade potentials. The first one derives *out-of-sample* trade potential estimates, i.e. referring to the EU-CEECs literature, the parameters for EU (or OECD) countries are estimated by a gravity model and then the same coefficients are applied to project “natural” trade relations between EU countries and CEECs. The difference between the observed and predicted trade flows should represent the unexhausted trade potential. The second strategy derives *in-sample* trade potential estimates, i.e. CEECs are included in the regression analysis and the residuals of the estimated equation should represent the difference between potential and actual trade relations.

In spite of the strategy in use authors tend to associate strong conclusions from the sign of the difference between potential and effective trade flows. Sentences like the one contained in International Trade Centre (2003): when "... two

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[2] The main finding of the EU-CEECs literature is that the actual level of EU-CEECs trade due to the effectiveness of pre-accession agreements - the Europe Agreements in particular - has reached its potential level. Most of the past trade potential has already been realized and the expected effects of further EU enlargement to the East will be modest, in terms of both adjustment costs and expected gains (see Gros and Gonciarz 1996 on this view and Nilsson 2000 for a critique).

countries trade currently much more than the gravity models predicts ... there is a very successful bilateral partnership ... . When the two countries trade much less than in theory ... there seems to be an untapped trade potential," can be considered a common feature of a large share of the literature.

The policy implications associated to the finding of a negative sign (untapped trade potential) in the difference between effective and potential trade go from the necessity of country specific export promotion and of broader bilateral integration, to the need to anticipate relevant distribution changes due the effect of the expansion in bilateral trade flows in the near future.

A positive sign (successful partnership) in the difference between effective and potential trade generates different policy advises, such as the one prevailing in the EU-CEECs literature: trade has reached its potential level and no social cost has to be expected from future EU-CEECs integration.

Our suggestion is to take these advises with a grain of salt, especially if the sign in the difference between effective and potential trade is not robust to the use of different estimators of the gravity model. Is the sign stable?

3. THREE PANEL GRAVITY ESTIMATORS FOR EUROPEAN COUNTRIES' EXPORTS

In the following section in order to verify the robustness of the sign of the difference between effective and potential trade we climb the staircase of panel data specifications of the gravity model, starting from a static linear equation, and moving subsequently to a static linear equation with fixed effects, and finally to a dynamic linear system with fixed effects.

We estimated the same functional form for all the 11 European countries in our sample, using subsequently all three different estimators. We therefore disregard any specification issue related to single country, our emphasis being not on single country best fitting but on robustness of a *common* panel functional form to the change of estimators.

The choice of the functional form is also of limited relevance. We selected the "standard" functional form used more frequently in the empirical trade literature for no particular reason but being the mode in the meta-distribution ranging from the Zen functional form of Disdier and Head (2003), to the Baroque functional form of Rose and van Wincoop (2001). As far as we are concerned, any other functional form would have be equally fine.

3.1 The model, the dataset and the trade potential index

Along the lines of the traditional gravity approach, we start estimating an equation of bilateral exports of goods and services in a static form. We consider 11 European exporter countries[3] and 32 importer countries (the 11 euro countries plus 21 other countries[4]). The estimates refer to the period 1991-2000.

These flows cover, on average, 86% of total exports share in value terms in 2000. Export data are in dollar terms, current prices (source IMF Direction of Trade statistics), deflated by export deflators (source Economist Intelligence Unit). GDP data are in US dollar at 1996 prices (source Economist Intelligence Unit); distance measures are taken from John Haveman's database;[5] trade agreement dummy is built on the base of WTO information.

The estimated equation is

$$ln(EXP_{it})=\alpha+\beta_1 ln(GDP_{it})+\beta_2 ln(DIST_i)+\beta_3 AGR_{it}+\beta_4 BORD_i+\ \varepsilon_{it} \qquad (1)$$

where i=1,2,…31 are the destination countries; t=1991,…2000 is the time span; *GDP* is gross domestic product and *DIST* is distance in KM between exporter and destination countries capital cities; *AGR* is a trade agreement dummy that takes value 1 when a trade agreement between the exporter and the partner country occurs, 0 otherwise; *BORD* is border dummy that takes value 1 if the exporter and the partner country share a common border.

Following the gravity approach, export flows were expected to be positively influenced by: (1) the dimension and the demand potentiality of host market (proxied by GDP), (2) the presence of trade agreements, (3) the geographical closeness (proxied by the presence of a land or sea border). On the other hand, bilateral exports flows are expected to be negatively correlated with the geographical distance of host's market, a proxy of trade costs, *Home bias* and time and search costs (Disdier and Head, 2003).

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[3] The countries are the European countries that joined the euro in 1999: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxemburg, the Netherlands, Portugal, and Spain. Data for Belgium and Luxemburg have been aggregated.

[4] They are Argentina, Australia, Brazil, Canada, China, Czech Republic, Denmark, Korea, Hong Kong, Hungary, Japan, Mexico, Norway, Poland, Romania, Russia, Sweden, Switzerland, Turkey, United Kingdom, United States.

[5] John Haveman's database is available on the web at the following URL http: //www.macalester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/Data/G avity/dist.txt.

We estimated this equation by a OLS estimator, with a White heteroskedasticity correction. The estimated coefficients are statistically significant and the signs are the expected ones.

From the estimated coefficient, we calculate an *in-sample trade potential index*:

$$\text{POTTRADE}_i = \frac{EFFTRADE_i}{FITTRADE_i}$$

where $EFFTRADE_i$ are the real export flows from exporter country to partner country i, and $FITTRADE_i$ are the fitted export flows generated by the gravity equation.

Then, we standardized $POTTRADE_i$ so that the index would take values between [-1,1],

$$SPT_i = \frac{POTTRADE_i - 1}{POTTRADE_i + 1}$$

A positive index value (0,1] shows a higher bilateral effective trade than what the model predicts; negative values [-1,0) show the opposite.

Index values of bilateral potential trade calculated by the estimation of equation (1) are depicted for each one of the 11 European countries in figures 1-10 in the Appendix. We will describe the figures and comment on the resulting *SPT*s of different specifications all together.

3.2 Fixed effects

Taking equation (1) as our starting point, the first element we add to it is time invariant country-specific effects.

There are good reasons to argue that country-specific fixed effects are relevant when export or import effects (like tariff and non-tariff barriers) or "environmental" determinants that could drive or hamper trade flows (geographical, political or historical determinants) are present. These factors are deterministically linked to the countries specific characteristics and cannot be considered as random.[6] Besides, a fixed effect (within) estimator - including in

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[6] From an econometric point of view, it has been shown that fixed effects methodology has to be preferred to random effects models in the analysis of bilateral trade flows (Egger 2002). See also Baldwin (1994) and Mathyas (1997, 1998) for a description of further advantages of this methodology.

a constant term all the country-specific characteristics – avoids misspecification problems due to omitted variables.[7]

Indeed, considering bilateral fixed effects is the way to obtain a version of the gravity equation that can be viewed as a reduced form of a model of trade with solid microfoundations. In particular, we refer to Anderson and van Wincoop (2003), in which the authors develop a multilateral "trade resistance index". In this model, trade between a pair of countries depends on their bilateral trade barriers with all trade partners; trade will be stronger for those countries with a relatively low trade barrier. Following Rose and van Wincoop (2001), we approximated the multilateral "trade resistance index" using country-pair fixed effects.

Taking into account these considerations, we estimated our equation by a within estimator, i.e. a data panel with fixed effects which included specific regression constants for the observations on different host market. Consequently, all the time invariant terms (borders and distance) are now dropped and included in the bilateral constant terms.

The equation is now

$$\begin{aligned} ln(EXP_{it}) &= \beta_1 ln(GDP_{it}) + \beta_3 AGR_{it} + u_{it} \\ u_{it} &= v_i + \varepsilon_{it} \end{aligned} \qquad (2)$$

where v_i are unobserved bilateral country-level effects and ε_{it} is the error term.

The estimated coefficients are again statistically significant and the signs are the expected ones. Also in this case results are used to derive the *SPT* depicted in figures 1-10 in the Appendix.

3.3 Dynamics, persistence and fixed effects

Short run can be generally very relevant in trade analyses, since countries that trade a lot with each other normally tend to keep on doing so. Such inertia mainly derives from the sunk costs borne by exporters when they set up distribution and service networks in the partner country, which give rise to substantial entrance and exit barriers (Eichengreen and Irwin 1997). This sticky

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[7] A well known problem in works adopting gravity equations is the measurement of geographical distance. If distance reflects comparative advantages related to geography (Melitz 2001), it is not clear which sign can be expected for: an increase in distance might increase, not diminish, trade, if differences in comparative advantage prevail. A fixed-effect estimation bypasses this kind of problems by including distance in bilateral constant terms.

behaviour seems all the more important in the EMU case, where trade relationships between countries are affected not only by past investments in export-oriented infrastructure, but also by the accumulation of invisible assets such as political, cultural and geographical factors characterizing the area and influencing the commercial transactions taking place within it.

All these arguments boil down to the importance of a dynamic specification. The coefficient of the lagged endogenous variable catches the relevance of persistence in bilateral trade patterns.

Notwithstanding the empirical meaningfulness of this “persistence effect", it is worth noticing that quite few studies, based on a panel estimation of gravity equations, have considered the possibility to control for the statistical significance of the lagged bilateral trade (Egger, 2000b; De Grauwe and Skudelny, 2000; Bun and Klaassen 2002; De Nardis and Vicarelli, 2003).

The introduction of dynamics in a panel data model raises serious econometric problems due to the inconsistency of the estimators (Baltagi, 2001).[8] Anderson and Hsiao (1981) proposed a two steps strategy based on differencing and instrumenting, lately refined by Arellano and Bond (1991).[9]

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[8] If trade is a static process, the within estimator is consistent for a finite time dimension T and an infinite number of country-pairs N. But if trade is a dynamic process, the estimate of a dynamic panel such as our static model (1) with the inclusion of a lagged dependent variable is more complex. If country specific effects are unobserved, they are included in the error term; the introduction of the lagged dependent variable on the right hand side of the equation leads to correlation between the lagged dependent variable and the error term that (for a finite T and an infinite N) renders least square estimator biased and inconsistent. If time dimension T is fixed, the transformation needed to wipe out the country-pair fixed effects could not resolve the problem: the LS estimator will lead again to biased and inconsistent results since the correlation between the transformed lagged dependent variable and the error term will not tend to zero even if the cross section dimension N increases. A within estimator applied to a first order autoregressive model yields consistent estimates only when the number of time periods T is large (Nickell, 1981).

[9] The first step consists in differencing the equation (such as (1)) in order to remove the fixed effects. Since the transformed error term is now contemporary correlated with $ln(EXP_{it-1})$ the estimates will still be inconsistent. So, in the second step Anderson and Hsiao suggest that either the two period lagged difference or the two period lagged level of dependent variable could be used as instrument for $ln(EXP_{it-1})$, as both are correlated with the latter term while are uncorrelated with $\Delta[\text{epsilon}]_{it}$; both instruments will lead to a consistent estimator. Building on that intuition Arellano and Bond (1991) suggested that significant efficiency gains may be reached by using the Hansen two-step generalized method of moments (GMM) estimator. They identified how many lags of the dependent variable and of the pre-determined variables were valid instruments and how to combine these lagged levels with first differences of the strictly exogenous variables into a potentially very large instrument matrix.

As far as the gravity model, the proposed strategy is however not costless. On the one hand, first-differencing the equation removes fixed effects but also time invariant regressors that are in the specification. If those regressors are of interest, the loss of information implied can be of no second order. On the other hand, first-differenced GMM estimator performs poorly in terms of precision if it is applied to short panels (along the *T* dimension) including highly persistent time series (Blundell and Bond, 1998). Lagged levels of time series that have near unit root properties are in fact weak instruments for subsequent first-differences. Since bilateral exports between (old and new) industrialized countries are expected to change sluggishly, one might suspect that this would affect our estimates.

Arellano and Bover (1995) describe how, if the original equations in levels were added to the system of first-differenced equations, additional moment conditions could be brought to bear to increase efficiency. They show how the two key properties of the first differencing transformation - eliminating the time-invariant individual effects while not introducing disturbances for periods earlier than period *t*-1 into the transformed error term - can be obtained using any alternative transformation (i.e. forward orthogonal deviations).

Blundell and Bond (1998) articulated the necessary assumptions for this “system GMM" estimator more precisely and tested it with Monte Carlo simulations. Bond (2002) is good introduction to these estimators and their use.

We already stressed the importance of country pair fixed effects. Also in a dynamic framework we want to consider it explicitly: after removing the country-pair specific effect from the error term, thus eliminating the source of correlation between the latter and lagged dependent variable, we reintroduce it considering a constant term between each country pair of our sample. Using a “system GMM" estimator first-difference equations and level equations are considered. Thus, our set of bilateral time-invariant dummies remains in the level regression describing all the time independent influences that affect trade between any two countries, like cultural, social and political factors that could not be included in the “persistence" effect picked up by the coefficient of the lagged dependent variable.

We adopted a dummy for each destination country, i.e. a different dummy for each specific pair (the exporter country and the destination market), that assumes a value of 1 in all years, 0 otherwise.

The estimated equation takes the form:

$$ln(EXP_{it}) = \beta_1 ln(GDP_{it}) + \beta_2 ln(DIST_i) + \beta_3 AGR_{it} + \beta_4 BORD_i + \\ + \beta_5 ln(EXP_{it-n}) + \beta_6 COUNTRYPAIR + u_{it} \qquad (3)$$

$$u_{it} = v_i + \varepsilon_{it}$$

where $DIST_i$, $BORD_i$, and $COUNTRYPAIR$ are strictly exogenous covariates, EXP_{it-n} is endogenous, and GDP_{it} and AGR_{it} are predetermined.

4. RESULTS

Equations (1), (2) and (3) were estimated using in a sequel OLS, the Within estimator and "system GMM" discussed previously. Results are as expected: all the covariates are statistically significant, signs are correct, and the fit of the regressions is as usually high. Since our focus is not on parameters estimate but on the resulting *SPT*, we do not fully discuss the results (contained in the Appendix) but we concentrate on how the *SPT* varies with the change in estimator used.

Moving from (1) to (2), and from (2) to (3) the fit of the regression improves. This can be seen through the change in *SPT*: since the *SPT* index is built on the residuals of the regression, its absolute value is smaller the higher is the missfit of the regression and the standard error of the regression.

In figures 1-10 we plot the *SPT* index computed on the base of each version of gravity equation considered (*s* means "static" and refers to equation (1); *s-fix* means "static with fixed effects" and refers to equation (2); and *d-fix* means "dynamic with fixed effects" and refers to equation (3)). For each year in the time span the ratio between bilateral effective trade and potential trade is calculated. The *SPT* index is therefore the simple 1992-2000 average of those yearly values.

Each different figure depicts the *SPT* index of each one of the EU countries with respect to its 31 partners. Partner countries are ordered alphabetically from left to right, and in each panel the value of the *SPT* index obtained through the three panel gravity estimators is shown. Bullets (o) stand for positive values, crosses (+) for negative ones.

Figures 1-10 show *SPT* changes with respect to the choice of estimator. Indeed, starting from (1) and moving to (3), index values show a clear path of “convegence" toward the demarcation value: a downward “convergence" if the starting value of the index (the value of *SPT* generated by (1)) is positive, an upward “convergence" if the value of *SPT* is negative.[10]

Furthermore, the dynamic specification of the model lowers the dispersion of potential trade index around its mean: the standard deviation of *SPT* index - calculated for everyone of the 11 European countries with respect to its 31 host markets – decreases moving from (1) to (3) for each exporter country considered, converging towards the demarcation value.

143 cases (46%) of negative *SPT* resulted from the OLS regression, indicating relevant untapped trade potentials. With the use of the within estimator negative *SPT*s drop to 74 cases (24%). With the system GMM estimator only 5 cases remain. Even if we consider that the system GMM estimator has the chance of being downward biased and that the *SPT* is an average value, the path towards the demarcation value is so evident to call against the many exaggerated reports on trade potentials.

On the other hand, the sign of *SPT* is not robust to the change in estimator. More than a half of the cases reported in figures 1-10 (176/310) does change sign moving from one estimator to the other. More precisely, we observe that 46% of the cases changed signs moving from *s* to *d-fix*, 38% changed signs moving from *s* to *s-fix*, whilst 23% changed signs moving from *s-fix* to *d-fix*. The change in sign is therefore remarkably high, and this is the case not only moving from OLS to the within estimator, but also moving from the within estimator to the system GMM estimator.

If trade is a dynamic process, the use of a dynamic specification such as (3) instead of (2) is of no minor importance. Since *SPT* is remarkably sensible to the choice of the estimator, the indications of untapped trade potential or of successful partnership should at least take into account the role played by dynamics, and the invariance in the sign of *SPT* has to be checked.

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[10] The only case that runs against that evidence is the case of Austrian exports towards Romania.

CONCLUSIONS

In this paper we show how the result of a gravity model in terms of a potential trade index changes introducing in a “standard” specification fixed effects and dynamics.

There are two main pieces of evidence resulting from the analysis. First, when we estimate a gravity equation through a dynamic estimator instead of a static one, generally we obtain better results in terms of standard error of regression: the fitted value are more close to historical values. The dynamic specification of the model lowers the dispersion around *SPT*: the standard deviation of the index decreases moving from (1) to (3), converging towards the demarcation value.

It follows that an *SPT* index derived from a dynamic specification gives more accurate indications on the spread between actual and potential trade. Since the difference between the two could be interpreted as a sign of misspecification (Egger, 2000a), one should be more confident in interpreting the difference between observed and in-sample predicted trade flows not as pure indication of the loose specification of the econometric model.

Secondly, the choice of the estimator (static or dynamic) is very important if we want to draw some policy guidelines from a gravity equation. The same “standard" gravity equation can give very different results in terms of *SPT* index if we estimate it through a static estimator instead of a dynamic one.

In the large majority of the cases examined the *SPT* changed sign according to the estimator used. In that cases, it would be improvident to draw any policy implication in terms of trade policy if the evidence of untapped trade potential or successful partnership is not robust to the use of different estimators.

APPENDIX: FIGURES AND TABLES

Figure 1: Visual summary of standardized effective/potential trade

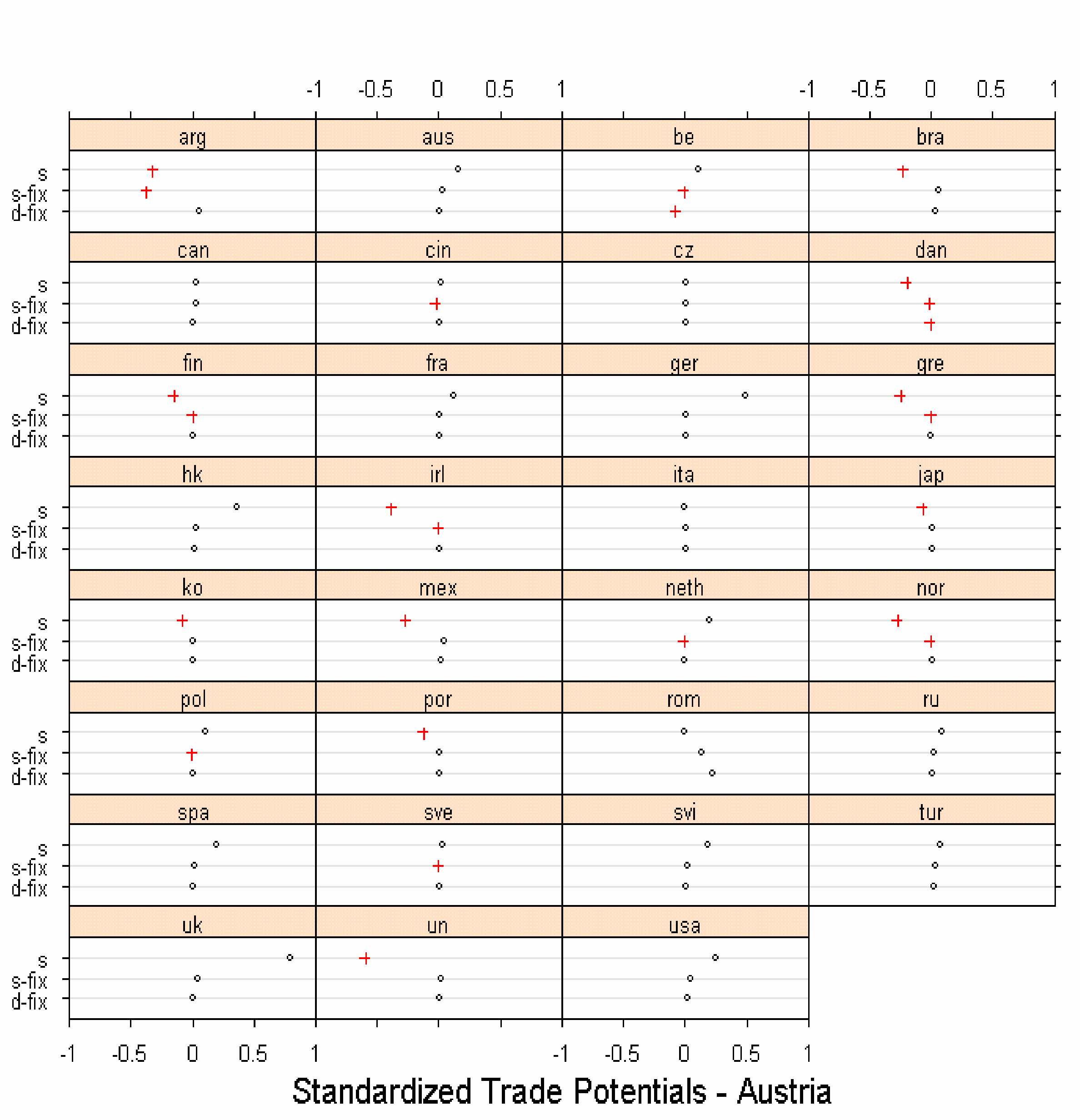


Figure 2: Visual summary of standardized effective/potential trade

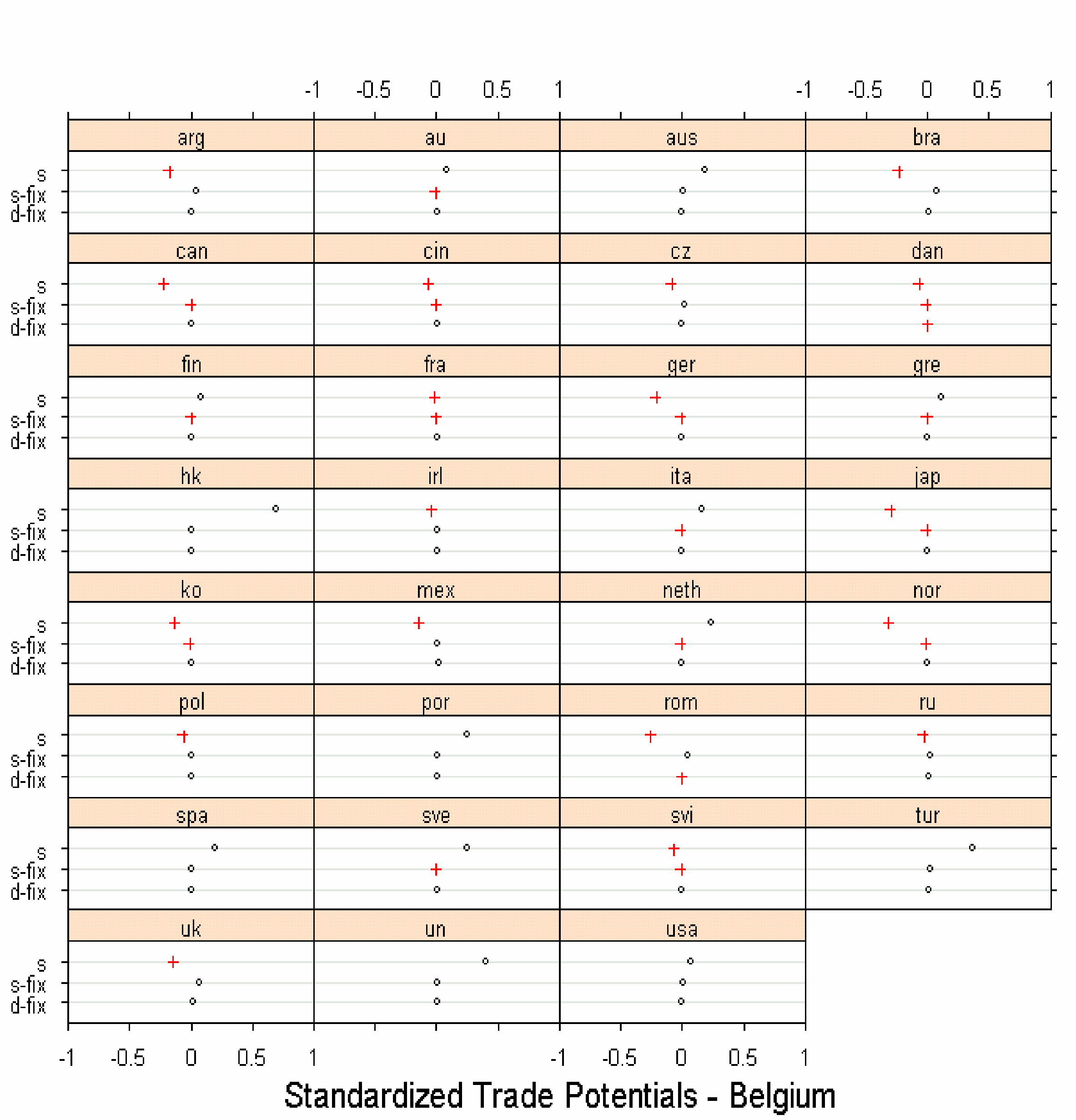


Figure 3: Visual summary of standardized effective/potential trade

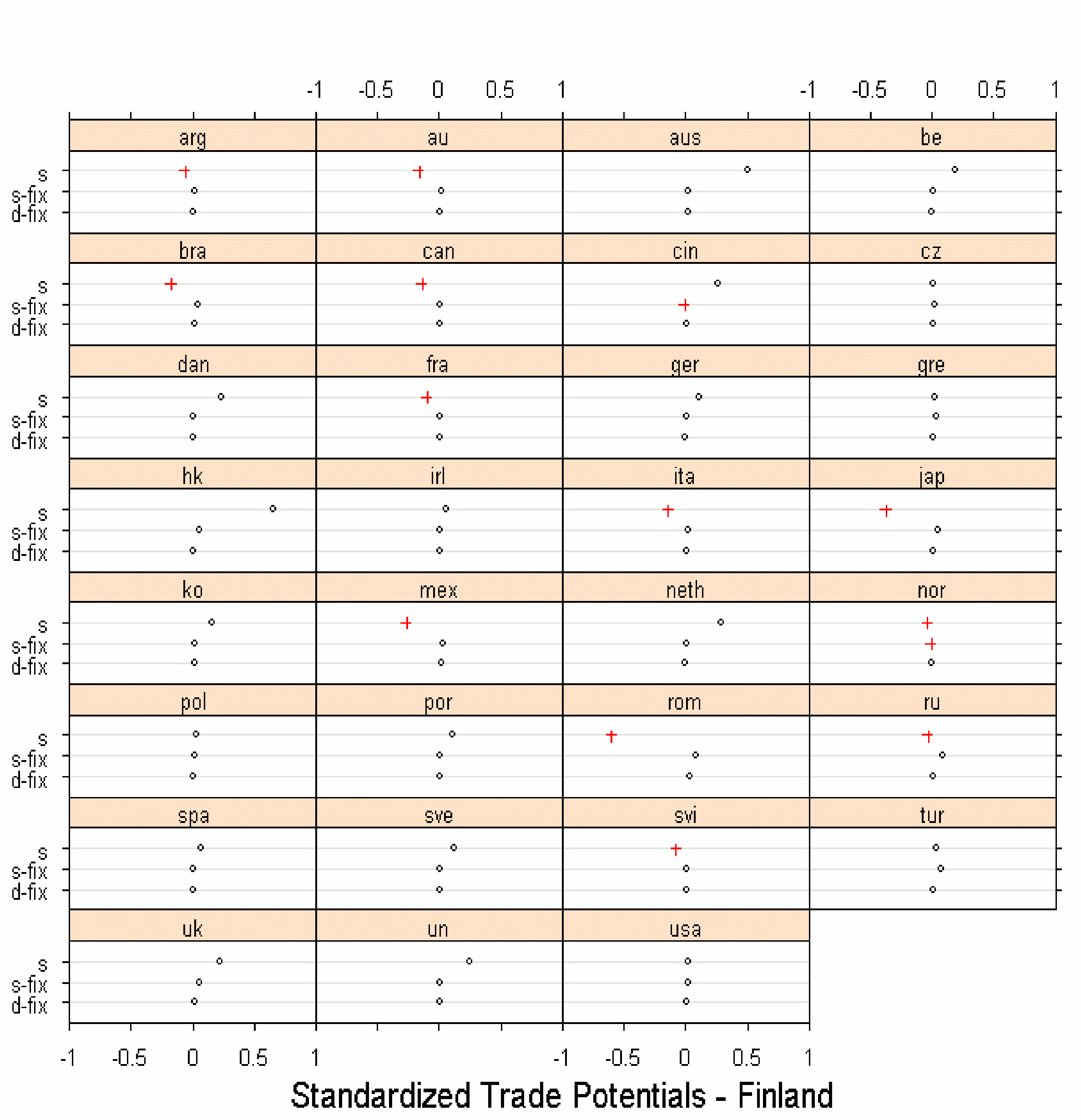


Figure 4: Visual summary of standardized effective/potential trade

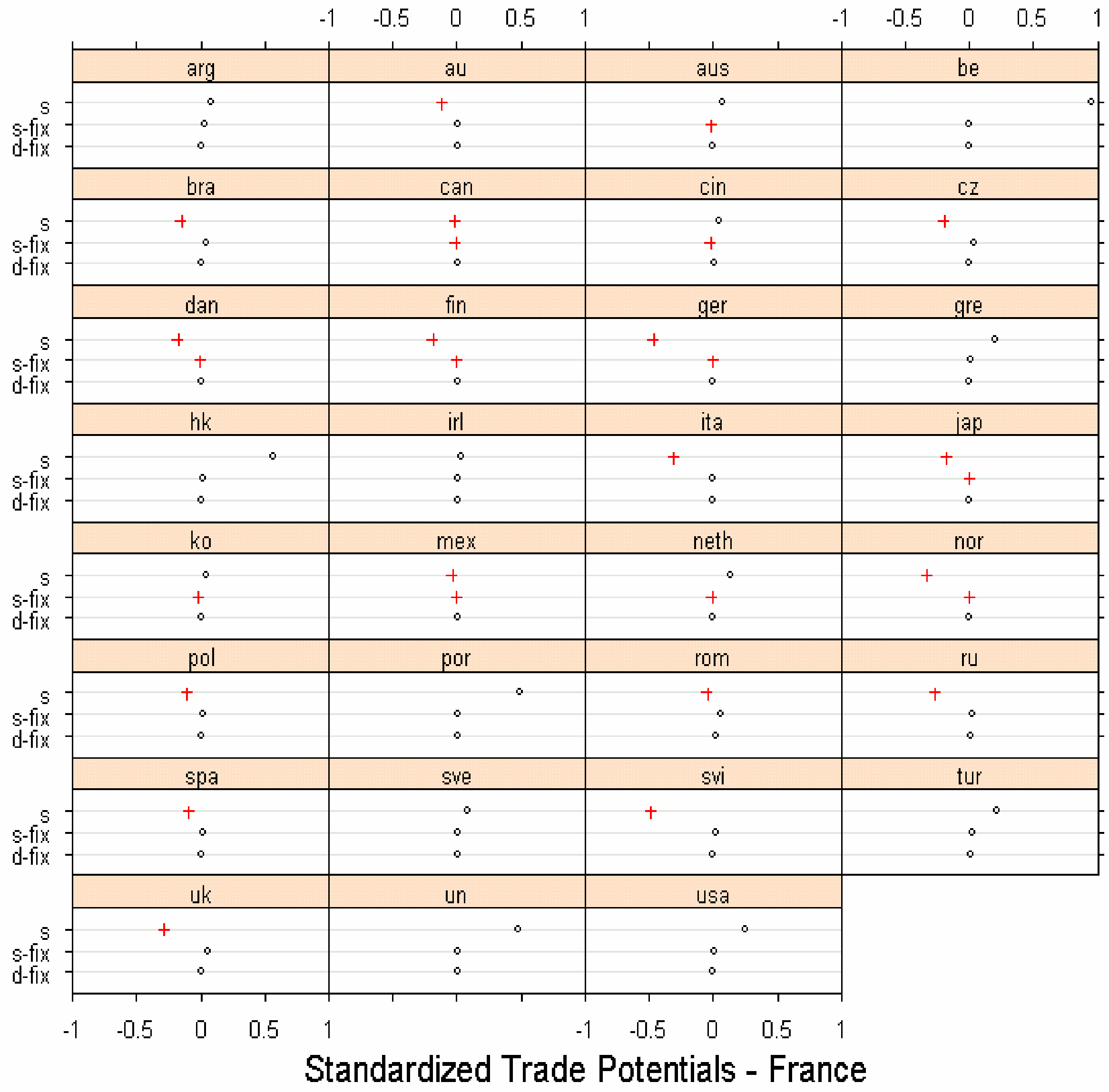


Figure 5: Visual summary of standardized effective/potential trade

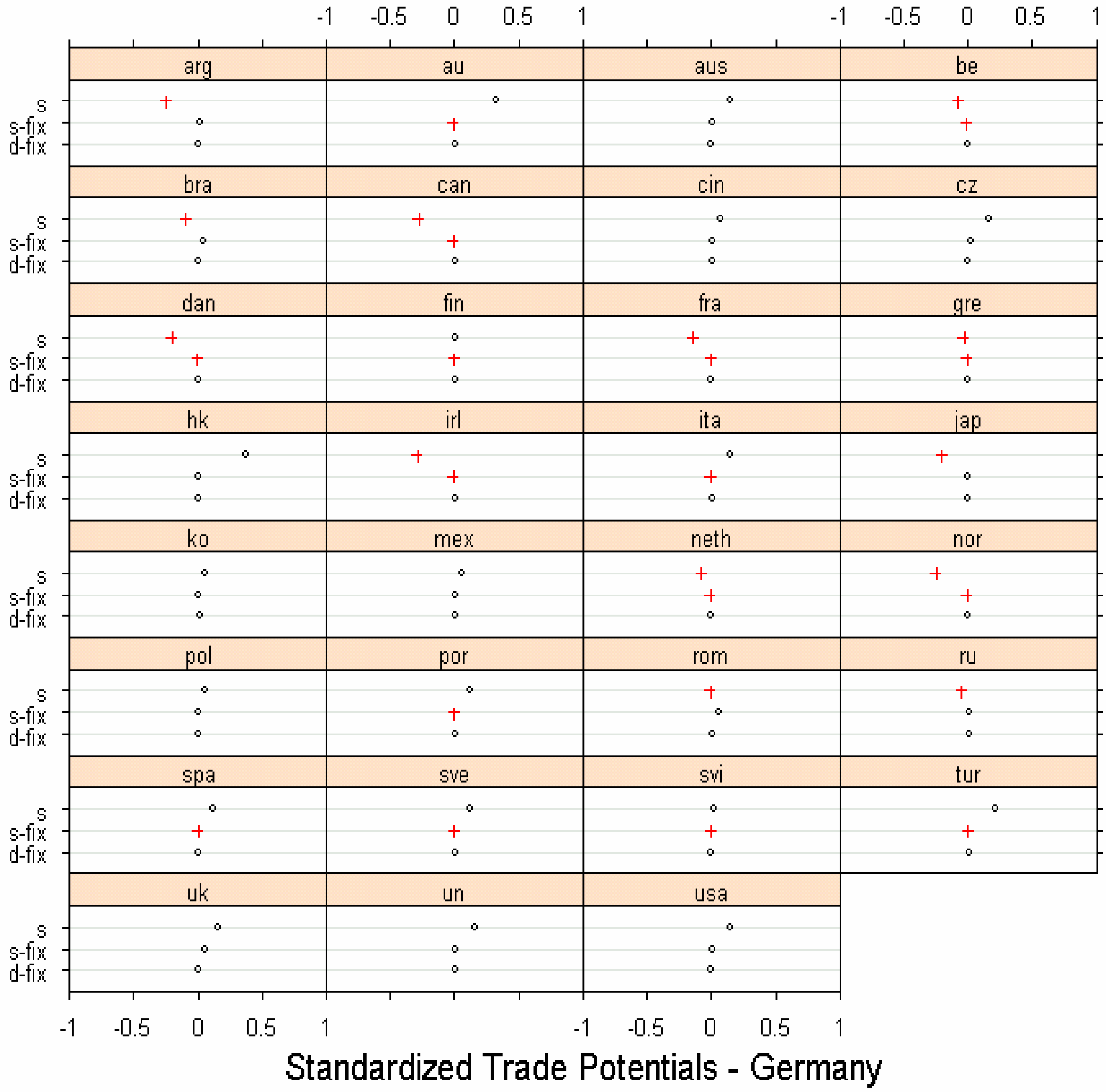


Figure 6: Visual summary of standardized effective/potential trade

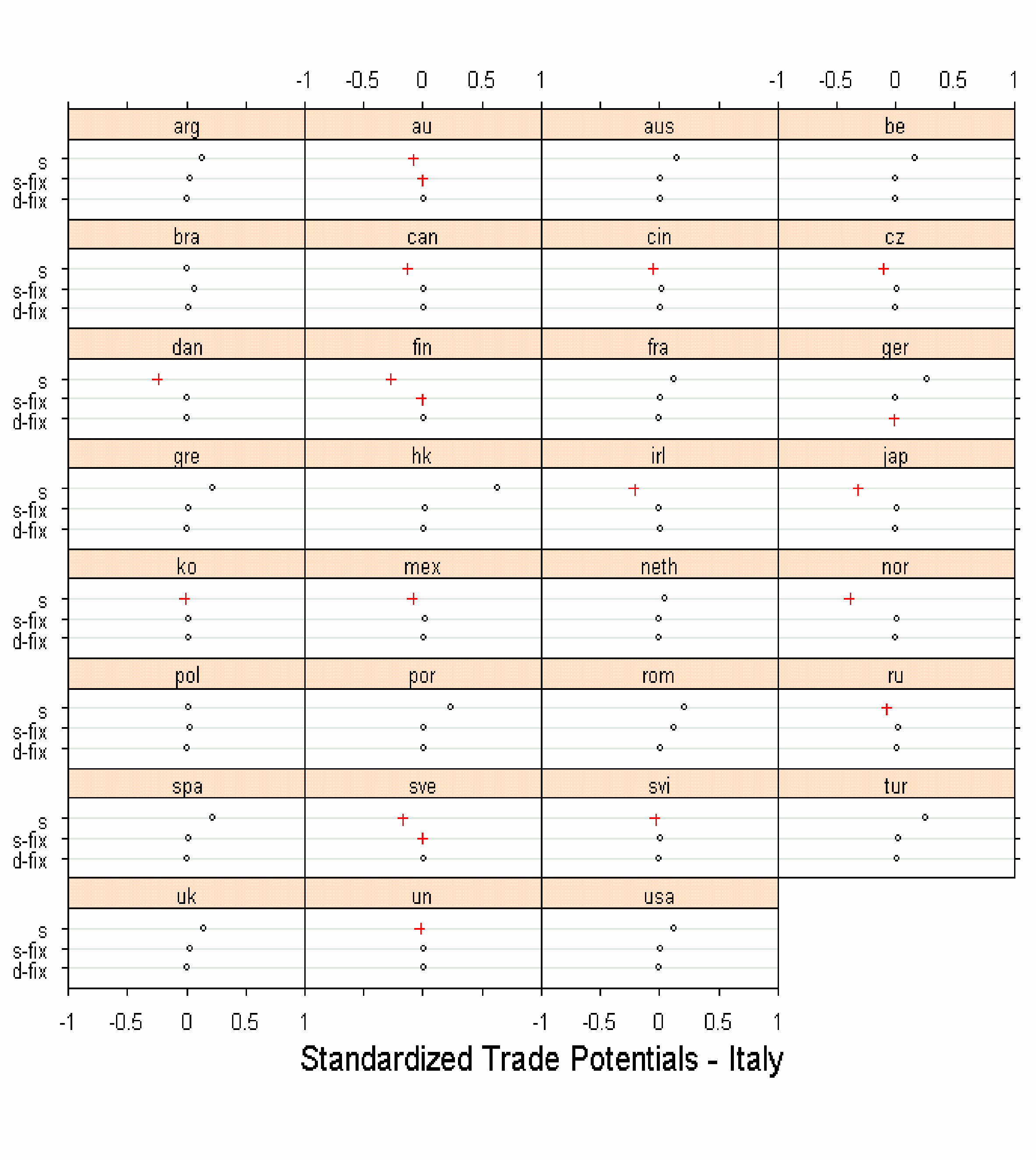


Figure 7: Visual summary of standardized effective/potential trade

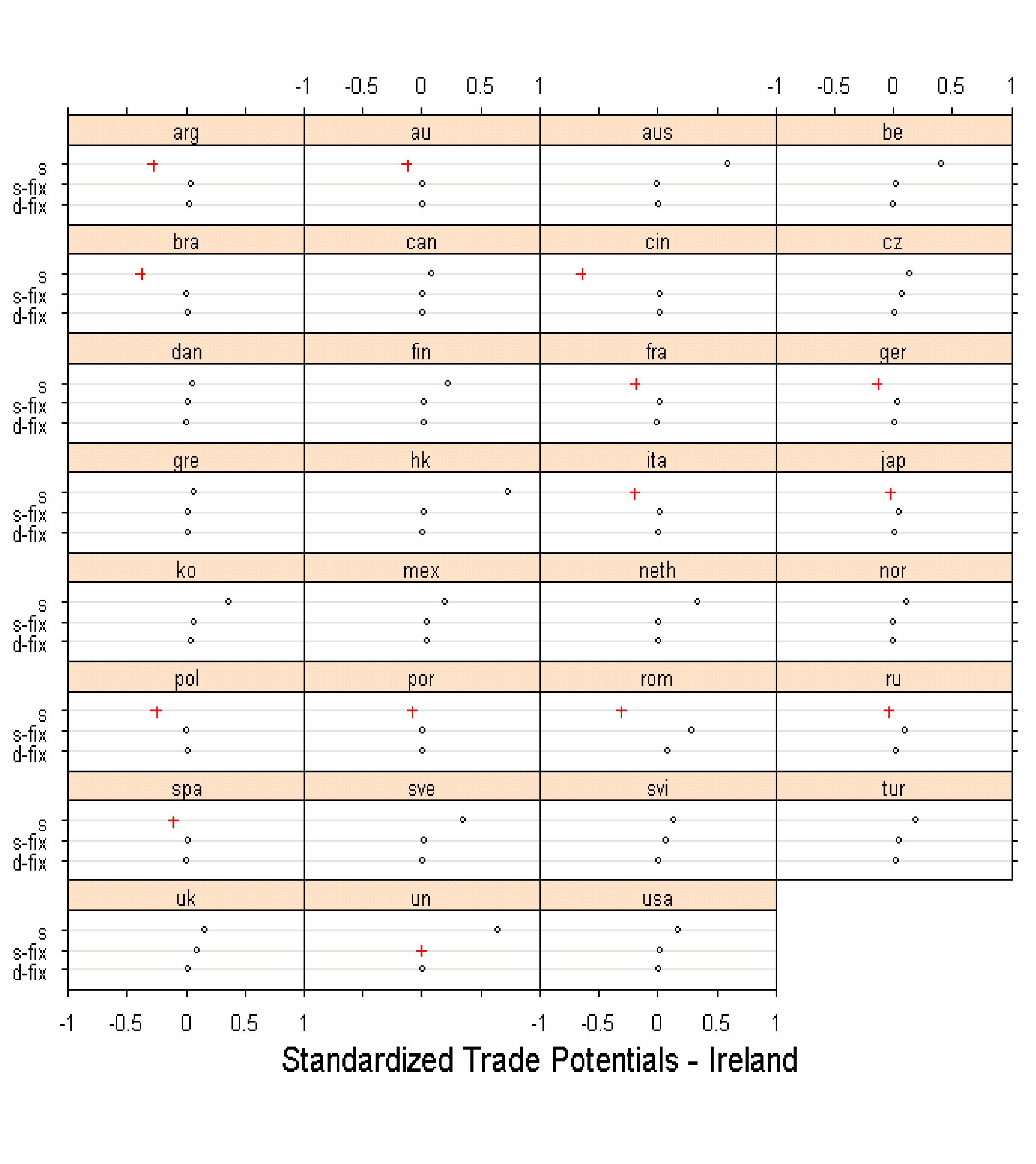


Figure 8: Visual summary of standardized effective/potential trade

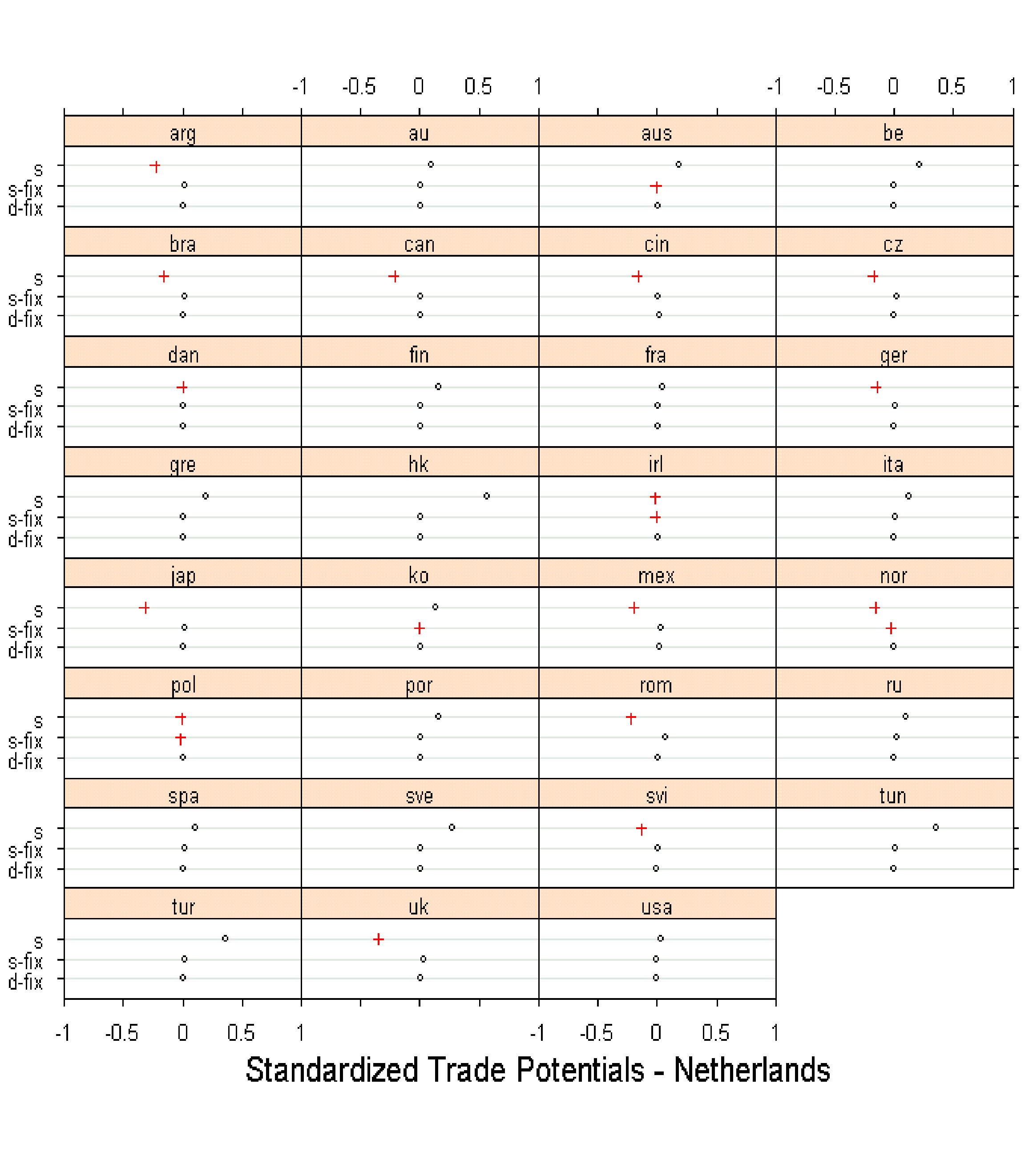


Figure 9: Visual summary of standardized effective/potential trade

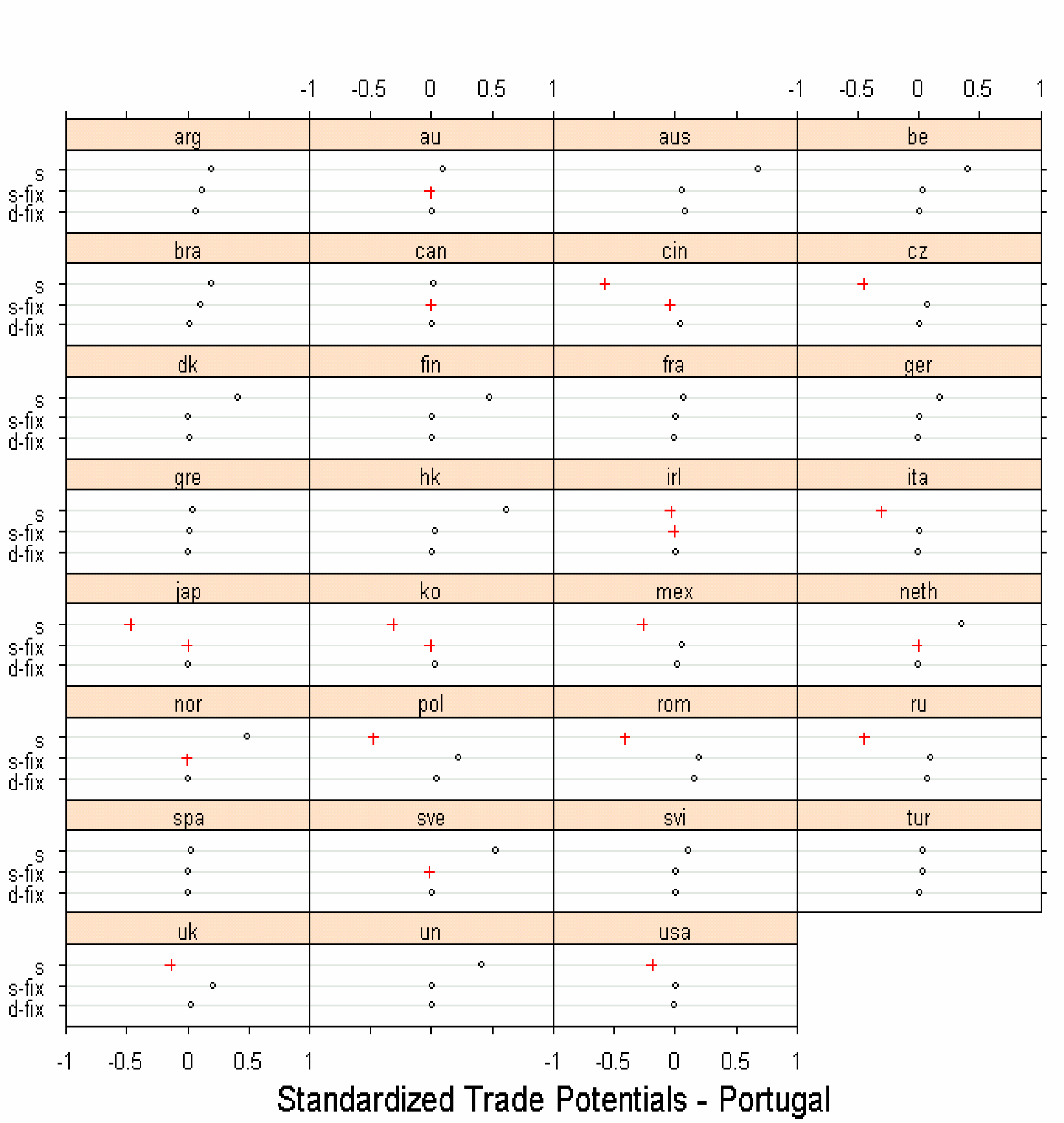
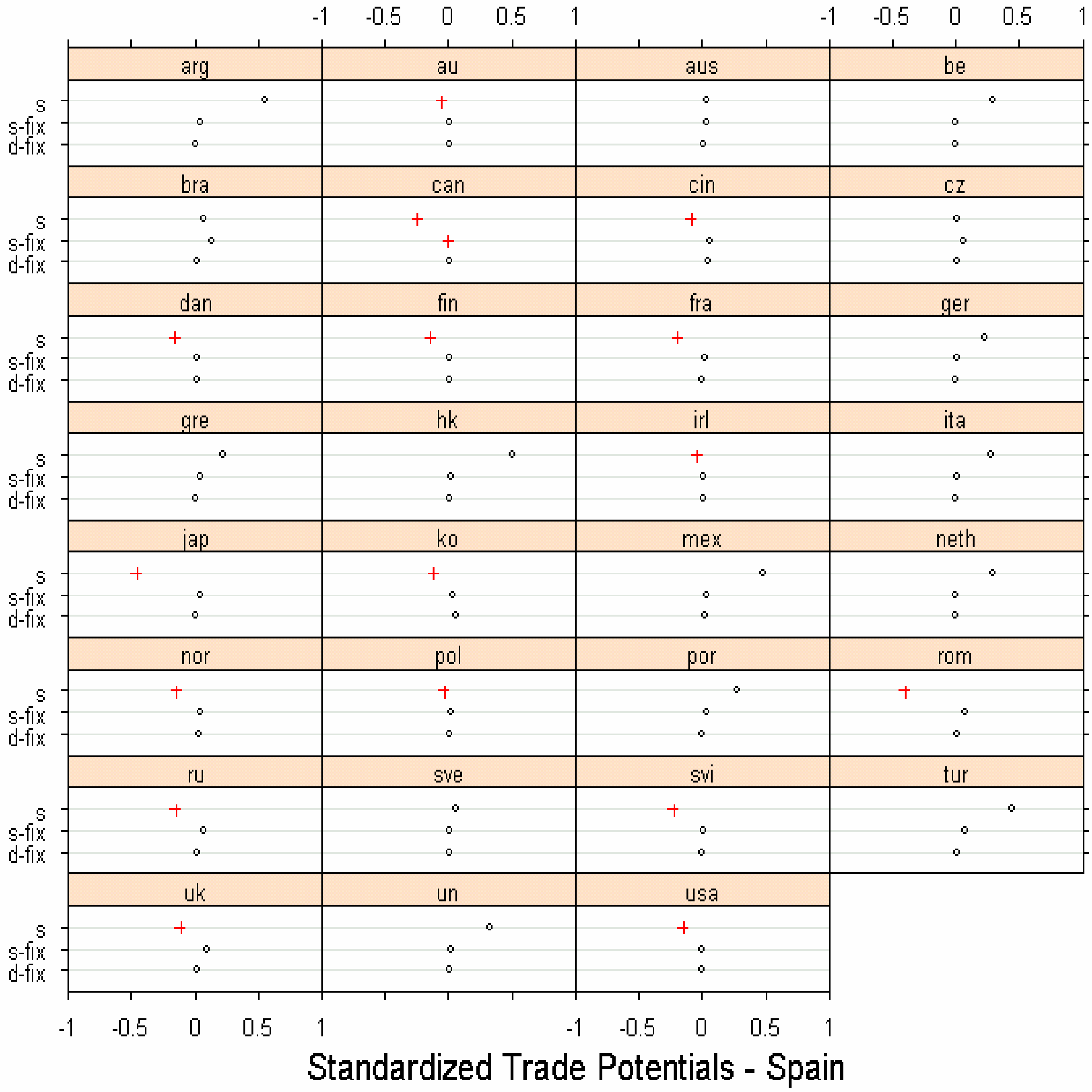


Figure 10: Visual summary of standardized effective/potential trade



AUSTRIA

Model 1. OLS estimate results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
LnGDP	0.535131	0.042249	12.67	0	0.451987	0.618274
lnDIST	-0.46739	0.060054	-7.78	0	-0.58558	-0.34921
AGR	0.540733	0.113708	4.76	0	0.316963	0.764503
BORD	0.877275	0.169245	5.18	0	0.544213	1.210337
_const	2.040572	0.45855	4.45	0	1.138179	2.942966

Number of obs = 304
F(4, 299) = 129.78
Prob > F = 0.0000
R-squared = 0.6296
Adj R-squared = 0.6345
Root MSE = 0.81032

Model 2. Fixed effects (within) regression estimates results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	1.793777	0.32419	5.53	0	1.155525	2.432029
AGR	0.31623	0.092648	3.41	0.001	0.133829	0.498631
lnDIST	(dropped)					
BORD	(dropped)					
_const	-8.66748	1.881186	-4.61	0	-12.3711	-4.96388

Fixed effects not reported

R-sq: within = 0.2235
between = 0.2075
overall = 0.1938

Model 3. System GMM dynamic panel-data estimates results, one-step

	Coef.	Robust Std. Err.	t	P>|t|	95% Conf. Interval	
Lnexp						
	0.180129	0.150232	1.2	0.24	-0.12669	0.486943
lnGDP	1.880504	0.6262	3	0.005	0.601634	3.159375
lnDIST	-0.92745	0.301006	-3.08	0.004	-1.54218	-0.31271
BORD	-5.8632	2.58973	-2.26	0.031	-11.1521	-0.57427
AGR	0.212719	0.069502	3.06	0.005	0.070777	0.354661
Auarg	-2.05771	0.7999	-2.57	0.015	-3.69133	-0.4241
Aufra	-4.81821	2.308971	-2.09	0.046	-9.53376	-0.10266
auaus	-1.49362	0.937135	-1.59	0.121	-3.4075	0.420269
Aube	-2.39533	1.329674	-1.8	0.082	-5.11089	0.320222
Aubra	-3.29165	1.44208	-2.28	0.03	-6.23677	-0.34653
aucan	-2.78957	1.387966	-2.01	0.054	-5.62418	0.045032
auchi	-3.07397	1.489877	-2.06	0.048	-6.1167	-0.03124
aucz	5.683831	1.943709	2.92	0.007	1.714248	9.653414
auden	-2.30963	1.151391	-2.01	0.054	-4.66108	0.041825
aufin	-1.48218	0.844167	-1.76	0.089	-3.2062	0.241841
auger	1.668701	0.328174	5.08	0	0.99848	2.338922
augre	-1.66692	0.863838	-1.93	0.063	-3.43111	0.097277
auhk	-0.0196	0.57423	-0.03	0.973	-1.19233	1.153134
auire	-1.02334	0.559135	-1.83	0.077	-2.16525	0.118563
auita	1.759475	0.441529	3.98	0	0.857753	2.661198
aujap	-5.66081	2.45546	-2.31	0.028	-10.6755	-0.64609
auko	-2.50021	1.213537	-2.06	0.048	-4.97858	-0.02184
aumex	-2.24077	1.004098	-2.23	0.033	-4.29141	-0.19012
auneth	-2.8205	1.560367	-1.81	0.081	-6.0072	0.366192
aunor	-1.98403	0.964437	-2.06	0.048	-3.95367	-0.01439
aupol	-1.71971	1.095218	-1.57	0.127	-3.95645	0.517021
aupor	-0.99595	0.672486	-1.48	0.149	-2.36935	0.377452
auru	-2.88996	1.508134	-1.92	0.065	-5.96998	0.190063
auspa	-3.05622	1.628331	-1.88	0.07	-6.38172	0.269274
auswe	-2.29148	1.250553	-1.83	0.077	-4.84545	0.262495
auswi	4.023879	1.244423	3.23	0.003	1.482428	6.56533
autur	-1.74693	1.027404	-1.7	0.099	-3.84517	0.351311
auuk	1.928352	0.537579	3.59	0.001	0.830468	3.026235
auusa	-6.06416	2.794541	-2.17	0.038	-11.7714	-0.35695

Arellano-Bond test for AR(1) in first differences: z = 0.06 Pr > z = 0.950
Arellano-Bond test for AR(2) in first differences: z = -1.31 Pr > z = 0.192

BELGIUM

Model 1. OLS estimate results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	0.801774	0.031346	25.58	0	0.740089	0.863459
lnDIST	-0.49661	0.055562	-8.94	0	-0.60595	-0.38726
AGR	0.650757	0.116911	5.57	0	0.420689	0.880826
BORD	0.601373	0.166472	3.61	0	0.273771	0.928974
_const	1.397898	0.471519	2.96	0.003	0.469994	2.325802

Number of obs = 305
F(4, 300) = 397.01
Prob > F = 0.0000
R-squared = 0.8411
Adj R-squared = 0.8390
Root MSE = 0.58101

Model 2. Fixed effects (within) regression estimates results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	2.209921	0.130931	16.88	0	1.952154	2.467687
AGR	0.302795	0.075708	4	0	0.153747	0.451844
lnDIST	(dropped)					
BORD	(dropped)					
_const	-10.3211	0.757507	-13.63	0	-11.8124	-8.82973

Fixed effects not reported
R-sq: within = 0.5568
between = 0.4086
overall = 0.4008

Model 3. System GMM dynamic panel-data estimates results, one-step

	Coef.	Robust st.error	t	P>|t|	95% Conf. Interval	
lnEXP						
	0.613614	0.086834	7.07	0	0.436276	0.790951
lnGDP	1.106787	0.256802	4.31	0	0.582328	1.631247
lnDIST	-0.49026	0.113471	-4.32	0	-0.722	-0.25852
BORD	-2.11691	0.58156	-3.64	0.001	-3.30461	-0.9292
AGR	0.096495	0.044924	2.15	0.04	0.004749	0.188242
bearg	-1.2112	0.334532	-3.62	0.001	-1.8944	-0.52799
befra	-1.14635	0.270956	-4.23	0	-1.69972	-0.59298
beaus	-1.11916	0.321677	-3.48	0.002	-1.77612	-0.46221
beau	-1.5859	0.406251	-3.9	0	-2.41557	-0.75622
bebra	-2.10469	0.559132	-3.76	0.001	-3.24659	-0.96279
becan	-2.14569	0.548741	-3.91	0	-3.26637	-1.02501
bechi	-2.08881	0.548492	-3.81	0.001	-3.20898	-0.96864
becz	-0.50644	0.145905	-3.47	0.002	-0.80442	-0.20846
beden	-1.50086	0.37097	-4.05	0	-2.25848	-0.74324
befin	-0.91342	0.245737	-3.72	0.001	-1.41528	-0.41156
beger	-1.73541	0.402477	-4.31	0	-2.55737	-0.91344
begre	-0.75518	0.199721	-3.78	0.001	-1.16307	-0.3473
behk	-0.01634	0.111445	-0.15	0.884	-0.24394	0.211262
beire	-0.71649	0.198807	-3.6	0.001	-1.12251	-0.31047
beita	-2.7157	0.687286	-3.95	0	-4.11932	-1.31207
bejap	-3.6599	0.915785	-4	0	-5.53018	-1.78962
beko	-1.76857	0.454683	-3.89	0.001	-2.69715	-0.83998
bemex	-1.47535	0.385211	-3.83	0.001	-2.26205	-0.68864
benor	-1.47416	0.339746	-4.34	0	-2.16802	-0.78031
bepol	-1.14637	0.294881	-3.89	0.001	-1.74859	-0.54414
bepor	-0.61284	0.182792	-3.35	0.002	-0.98616	-0.23953
beru	-1.94726	0.513811	-3.79	0.001	-2.9966	-0.89791
bespa	-2.08134	0.54128	-3.85	0.001	-3.18678	-0.9759
beswe	-1.43057	0.387483	-3.69	0.001	-2.22191	-0.63922
beswi	-2.04273	0.502075	-4.07	0	-3.06811	-1.01736
betur	-0.90466	0.290834	-3.11	0.004	-1.49862	-0.31069
behun	-2.47417	0.654121	-3.78	0.001	-3.81006	-1.13827
beuk	-0.69805	0.196534	-3.55	0.001	-1.09943	-0.29668
beusa	-3.88669	1.006201	-3.86	0.001	-5.94163	-1.83175

Arellano-Bond test for AR(1) in first differences: z = -2.80 Pr > z = 0.005
Arellano-Bond test for AR(2) in first differences: z = -1.35 Pr > z = 0.176

FINLAND

Model 1. OLS estimate results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	0.807593	0.030869	26.16	0	0.746847	0.868339
lnDIST	-0.72451	0.05586	-12.97	0	-0.83443	-0.61458
AGR	0.350121	0.089682	3.9	0	0.173637	0.526606
BORD	0.595523	0.150885	3.95	0	0.298596	0.892449
_const	2.53822	0.458887	5.53	0	1.635176	3.441264

Number of obs = 305
F(4, 300) = 230.75
Prob > F = 0.0000
R-squared = 0.7547
Adj R-squared = 0.7514
Root MSE = 0.64277

Model 2. Fixed effects (within) regression estimates results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	2.603139	0.179894	14.47	0.000	2.248977	2.957301
AGR	0.106956	0.050742	2.11	0.036	0.00706	0.206853
lnDIST	(dropped)					
BORD	(dropped)					
_const	-13.5666	1.046139	-12.97	0.000	-15.6262	-11.5071

Fixed effects not reported
R-sq: within = 0.5325
between = 0.3743
overall = 0.3579

Model 3. System GMM dynamic panel-data estimates results, one-step

	Coef.	Robust Std. Err.	t	P>|t|	95% Conf. Interval	
lnEXP	0.683006	0.038333	17.82	0	0.604719	0.761293
lnGDP	1.063235	0.191535	5.55	0	0.672067	1.454402
lnDIST	-0.5247	0.089491	-5.86	0	-0.70746	-0.34193
BORD	-1.80833	0.56272	-3.21	0.003	-2.95756	-0.6591
AGR	-0.03804	0.031394	-1.21	0.235	-0.10215	0.026076
finarg	-0.88348	0.245782	-3.59	0.001	-1.38543	-0.38152
finfra	-2.81913	0.722231	-3.9	0	-4.29412	-1.34413
finaus	-0.79175	0.312795	-2.53	0.017	-1.43057	-0.15294
finbe	-1.2877	0.409403	-3.15	0.004	-2.12382	-0.45159
finbra	-1.85944	0.450744	-4.13	0	-2.77998	-0.93889
fincan	-1.84392	0.460945	-4	0	-2.78529	-0.90254
fincin	-1.72965	0.50535	-3.42	0.002	-2.76171	-0.69759
fincz	-0.04979	0.139684	-0.36	0.724	-0.33506	0.235486
finden	-1.10395	0.389385	-2.84	0.008	-1.89918	-0.30872
finau	-1.39644	0.389212	-3.59	0.001	-2.19131	-0.60156
finger	-3.08782	0.81944	-3.77	0.001	-4.76134	-1.4143
fingre	-0.58957	0.232688	-2.53	0.017	-1.06479	-0.11436
finhk	-0.00048	0.198662	0	0.998	-0.40621	0.40524
finire	-0.23973	0.158549	-1.51	0.141	-0.56353	0.084071
finita	-2.58643	0.664312	-3.89	0.001	-3.94314	-1.22973
finjap	-3.54226	0.816295	-4.34	0	-5.20935	-1.87516
finko	-1.4214	0.408722	-3.48	0.002	-2.25612	-0.58667
finmex	-1.31908	0.313375	-4.21	0	-1.95908	-0.67909
finneth	-1.57282	0.496803	-3.17	0.004	-2.58743	-0.55821
finnor	0.828993	0.198555	4.18	0	0.423489	1.234496
finpol	-0.97155	0.338808	-2.87	0.007	-1.66349	-0.27961
finpor	-0.39995	0.190358	-2.1	0.044	-0.78871	-0.01119
finspa	-1.82122	0.512331	-3.55	0.001	-2.86754	-0.7749
finswe	0.277473	0.049803	5.57	0	0.175762	0.379184
finswi	-1.48613	0.415757	-3.57	0.001	-2.33522	-0.63704
fintur	-0.95746	0.313298	-3.06	0.005	-1.5973	-0.31762
finhun	-2.44053	0.692992	-3.52	0.001	-3.85581	-1.02525
finuk	0.266379	0.097217	2.74	0.01	0.067835	0.464924
finusa	-3.73602	0.925799	-4.04	0	-5.62675	-1.84529

Arellano-Bond test for AR(1) in first differences: z = -2.70 Pr > z = 0.007
Arellano-Bond test for AR(2) in first differences: z = 0.04 Pr > z = 0.971

FRANCE

Model 1. OLS estimate results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	0.664099	0.04894	13.57	0	0.567789	0.760408
lnDIST	-0.5021	0.072004	-6.97	0	-0.6438	-0.3604
AGR	0.080864	0.175409	0.46	0.645	-0.26433	0.426056
BORD	1.660283	0.174664	9.51	0	1.316557	2.00401
_const	3.324345	0.645741	5.15	0	2.053572	4.595118

Number of obs = 304
F(4, 299) = 172.27
Prob > F = 0.0000
R-squared = 0.6974
Adj R-squared = 0.6933
Root MSE = 0.87969

Model 2. Fixed effects (within) regression estimates results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	2.259785	0.11068	20.42	0	2.041884	2.477687
AGR	0.316977	0.064092	4.95	0	0.190795	0.443159
lnDIST	(dropped)					
BORD	(dropped)					
_const	-9.55893	0.633448	-15.09	0	-10.806	-8.31183

Fixed effects not reported
R-sq: within = 0.6494
between = 0.2492
overall = 0.2787

Model 3. System GMM dynamic panel-data estimates results, one-step

	Coef.	Robust Std. Err.	t	P>|t|	95% Conf. Interval	
lnEXP	0.618697	0.074647	8.29	0	0.466247	0.771148
lnGDP	1.125026	0.202867	5.55	0	0.710717	1.539336
BORD	-0.25555	0.516193	-0.5	0.624	-1.30976	0.798653
lnDIST	-0.42256	0.086981	-4.86	0	-0.60019	-0.24492
AGR	0.010456	0.088124	0.12	0.906	-0.16952	0.190428
fraarg	-1.31753	0.23982	-5.49	0	-1.8073	-0.82775
fraau	-2.00057	0.399404	-5.01	0	-2.81626	-1.18488
fraaus	-1.64195	0.278987	-5.89	0	-2.21172	-1.07218
frabra	-2.45678	0.445247	-5.52	0	-3.3661	-1.54747
fracan	-2.34076	0.425837	-5.5	0	-3.21044	-1.47109
frachi	-2.38065	0.444917	-5.35	0	-3.2893	-1.47201
fracz	-0.77348	0.185292	-4.17	0	-1.1519	-0.39506
fraden	-1.87045	0.368452	-5.08	0	-2.62293	-1.11797
frafin	-1.36401	0.254423	-5.36	0	-1.88361	-0.84441
frager	-3.58993	0.607058	-5.91	0	-4.8297	-2.35015
fragre	-0.97604	0.208245	-4.69	0	-1.40133	-0.55074
frahk	-0.44928	0.154861	-2.9	0.007	-0.76555	-0.13302
fraire	-0.78474	0.178781	-4.39	0	-1.14986	-0.41962
fraita	-2.63715	0.454929	-5.8	0	-3.56623	-1.70806
frajap	-4.09013	0.749951	-5.45	0	-5.62173	-2.55852
frako	-1.96628	0.357841	-5.49	0	-2.69709	-1.23547
framex	-1.72839	0.297074	-5.82	0	-2.3351	-1.12169
franeth	-2.5768	0.564124	-4.57	0	-3.7289	-1.42471
franor	-1.72882	0.321998	-5.37	0	-2.38642	-1.07121
frapol	-1.46183	0.302163	-4.84	0	-2.07893	-0.84473
frapor	-0.64758	0.181665	-3.56	0.001	-1.01859	-0.27657
Fraru	-2.43399	0.445191	-5.47	0	-3.3432	-1.52479
fraspa	-1.77765	0.351643	-5.06	0	-2.49581	-1.0595
fraswe	-1.82831	0.377092	-4.85	0	-2.59843	-1.05818
fraswi	-1.77219	0.369733	-4.79	0	-2.52728	-1.01709
fratur	-1.2284	0.267894	-4.59	0	-1.77551	-0.68128
frahun	-2.86488	0.627643	-4.56	0	-4.14669	-1.58306
frauk	-0.76677	0.167263	-4.58	0	-1.10837	-0.42518
frausa	-4.28493	0.841366	-5.09	0	-6.00323	-2.56663

Arellano-Bond test for AR(1) in first differences: z = -2.99 Pr > z = 0.003
Arellano-Bond test for AR(2) in first differences: z = 0.57 Pr > z = 0.567

GERMANY

Model 1. OLS estimate results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	0.684421	0.02066	33.13	0	0.643764	0.725079
lnDIST	-0.5628	0.040097	-14.04	0	-0.64171	-0.4839
AGR	0.151806	0.082132	1.85	0.066	-0.00982	0.313436
BORD	0.279583	0.07497	3.73	0	0.132047	0.427118
_const	4.624259	0.355518	13.01	0	3.924624	5.323894

Number of obs = 304
F(4, 299) = 441.65
Prob > F = 0.0000
R-squared = 0.8552
Adj R-squared = 0.8533

Model 2. Fixed effects (within) regression estimates results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	1.89339	0.096066	19.71	0	1.704259	2.082521
AGR	0.236558	0.055719	4.25	0	0.12686	0.346256
lnDIST	(dropped)					
BORD	(dropped)					
_const	-6.57394	0.548495	-11.99	0	-7.65379	-5.49409

Fixed effects not reported
R-sq: within = 0.6284
between = 0.3229
overall = 0.3295

Model 3. System GMM dynamic panel-data estimates results, one-step

	Coef.	Robust Std. Err.	t	P>|t|	95% Conf. Interval	
lnEXP	0.621586	0.07855	7.91	0	0.461165	0.782007
lnGDP	0.928743	0.236243	3.93	0	0.446271	1.411215
BORD	-0.18934	0.179768	-1.05	0.301	-0.55647	0.177794
lnDIST	-0.28608	0.090843	-3.15	0.004	-0.4716	-0.10055
AGR	0.092523	0.034383	2.69	0.012	0.022304	0.162741
gerarg	-1.47055	0.358953	-4.1	0	-2.20363	-0.73747
gerau	-0.86753	0.257411	-3.37	0.002	-1.39324	-0.34183
geraus	-1.40888	0.36963	-3.81	0.001	-2.16377	-0.65399
gerbe	-1.40237	0.398513	-3.52	0.001	-2.21624	-0.5885
gerbra	-2.03448	0.55936	-3.64	0.001	-3.17684	-0.89211
gercan	-2.11998	0.563178	-3.76	0.001	-3.27015	-0.96982
gerchi	-1.91919	0.562655	-3.41	0.002	-3.06828	-0.77009
gerden	-1.13794	0.255931	-4.45	0	-1.66062	-0.61526
gerfin	-0.9511	0.288072	-3.3	0.002	-1.53942	-0.36278
gerfra	-2.57246	0.71741	-3.59	0.001	-4.03761	-1.10731
gergre	-0.98036	0.257752	-3.8	0.001	-1.50676	-0.45396
gerhk	-0.59565	0.182732	-3.26	0.003	-0.96884	-0.22246
gerire	-0.84947	0.225283	-3.77	0.001	-1.30956	-0.38938
gerita	-2.41415	0.746351	-3.23	0.003	-3.9384	-0.8899
gerjap	-3.36609	0.927792	-3.63	0.001	-5.26089	-1.47128
gerko	-1.68169	0.45929	-3.66	0.001	-2.61969	-0.7437
germex	-1.41742	0.38488	-3.68	0.001	-2.20345	-0.63139
gerneth	-1.67511	0.476043	-3.52	0.001	-2.64731	-0.7029
gernor	-1.32175	0.359345	-3.68	0.001	-2.05563	-0.58787
gerpol	-0.71078	0.164309	-4.33	0	-1.04635	-0.37522
gerpor	-0.79435	0.228504	-3.48	0.002	-1.26102	-0.32768
gerru	-1.78209	0.527113	-3.38	0.002	-2.8586	-0.70558
gerspa	-1.94478	0.591436	-3.29	0.003	-3.15265	-0.73691
gerswe	-1.36533	0.438429	-3.11	0.004	-2.26072	-0.46993
gerswi	-1.34306	0.36261	-3.7	0.001	-2.0836	-0.60251
gertur	-0.95386	0.325566	-2.93	0.006	-1.61875	-0.28897
gerhun	-2.36763	0.746909	-3.17	0.003	-3.89302	-0.84224
geruk	-0.2134	0.151759	-1.41	0.17	-0.52333	0.096536
gerusa	-3.44856	1.031257	-3.34	0.002	-5.55466	-1.34245

Arellano-Bond test for AR(1) in first differences: z = -4.00 Pr > z = 0.000
Arellano-Bond test for AR(2) in first differences: z = -1.16 Pr > z = 0.248

IRELAND

Model 1. OLS estimate results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	1.077247	0.043338	24.86	0	0.99196	1.162533
lnDIST	-0.62066	0.097768	-6.35	0	-0.81307	-0.42826
AGR	0.91054	0.17911	5.08	0	0.558064	1.263016
BORD	-1.07126	0.321293	-3.33	0.001	-1.70354	-0.43897
_const	-0.53186	0.9107	-0.58	0.56	-2.32405	1.260332

Number of obs = 304
F(4, 299) = 217.47
Prob > F = 0.0000
R-squared = 0.7442
Adj R-squared = 0.7408
Root MSE = 0.87155

Model 2. Fixed effects (within) regression estimates results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	4.61606	0.215457	21.42	0	4.191878	5.040242
AGR	0.403096	0.11592	3.48	0.001	0.174877	0.631315
lnDIST	(dropped)					
BORD	(dropped)					
_const	-25.98	1.25454	-20.71	0	-28.4499	-23.5101

Fixed effects not reported

R-sq: within = 0.6608
between = 0.4937
overall = 0.4671

Model 3. System GMM dynamic panel-data estimates results, one-step

	Coef.	Robust Std. Err.	t	P>|t|	95% Conf. Interval	
lnEXP	0.715454	0.081407	8.79	0	0.5492	0.881709
lnGDP	1.433075	0.551829	2.6	0.014	0.306089	2.560061
lnDIST	-0.69059	0.250004	-2.76	0.01	-1.20117	-0.18001
BORD	0.14128	0.211489	0.67	0.509	-0.29064	0.573197
irearg	-1.72373	0.872578	-1.98	0.057	-3.50578	0.058307
ireau	-2.38734	1.007535	-2.37	0.024	-4.445	-0.32968
ireaus	-1.41399	0.828382	-1.71	0.098	-3.10578	0.277788
irlee	-2.63891	1.102886	-2.39	0.023	-4.89131	-0.38652
irebra	-3.1152	1.408312	-2.21	0.035	-5.99135	-0.23904
irecan	-2.94271	1.35466	-2.17	0.038	-5.70929	-0.17612
Irechi	-3.25856	1.510911	-2.16	0.039	-6.34426	-0.17287
Irlez	-0.51972	0.280659	-1.85	0.074	-1.09291	0.053457
ireden	-2.13567	0.864995	-2.47	0.019	-3.90222	-0.36911
Irefin	-1.44802	0.643133	-2.25	0.032	-2.76147	-0.13457
Irefra	-4.93973	2.016896	-2.45	0.02	-9.05879	-0.82068
Iregre	-1.30031	0.516207	-2.52	0.017	-2.35455	-0.24608
Irehk	-0.40207	0.454349	-0.88	0.383	-1.32998	0.525834
Ireita	-4.20865	1.722871	-2.44	0.021	-7.72722	-0.69008
Ireger	-5.2681	2.166697	-2.43	0.021	-9.69309	-0.84312
Irejap	-4.83654	2.195073	-2.2	0.035	-9.31947	-0.3536
Ireko	-2.10234	1.128517	-1.86	0.072	-4.40708	0.202402
iremex	-1.86961	0.968025	-1.93	0.063	-3.84658	0.107362
ireneth	-3.13955	1.317111	-2.38	0.024	-5.82945	-0.44966
Irenor	-1.89479	0.776925	-2.44	0.021	-3.48148	-0.3081
Irepol	-1.78014	0.732296	-2.43	0.021	-3.27568	-0.28459
Irepor	-1.54466	0.597373	-2.59	0.015	-2.76466	-0.32466
Ireru	-2.82775	1.305598	-2.17	0.038	-5.49413	-0.16136
irespa	-3.51108	1.439101	-2.44	0.021	-6.45011	-0.57204
Ireswe	-2.26203	1.007223	-2.25	0.032	-4.31905	-0.20501
Ireswi	-2.63418	1.105932	-2.38	0.024	-4.89279	-0.37556
irleur	-1.59061	0.863261	-1.84	0.075	-3.35362	0.172406
irehun	-3.63544	1.567622	-2.32	0.027	-6.83695	-0.43393
ireuk	-1.28258	0.507422	-2.53	0.017	-2.31888	-0.24629
ireusa	-5.62573	2.541609	-2.21	0.035	-10.8164	-0.43507

Arellano-Bond test for AR(1) in first differences: z = -2.00 Pr > z = 0.046
Arellano-Bond test for AR(2) in first differences: z = -0.60 Pr > z = 0.548

ITALY

Model 1. OLS estimate results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	0.715179	0.025569	27.97	0	0.664861	0.765497
lnDIST	-0.51308	0.055686	-9.21	0	-0.62266	-0.40349
AGR	0.327793	0.100408	3.26	0.001	0.130198	0.525388
BORD	0.304183	0.110991	2.74	0.007	0.085761	0.522606
Const	3.189012	0.479085	6.66	0	2.246207	4.131816

Number of obs = 304
F(4, 299) = 260.10
Prob > F = 0.0000
R-squared = 0.7768
Adj R-squared = 0.7738
Root MSE = 0.50898

Model 2. Fixed effects (within) regression estimates results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	1.866038	0.123742	15.08	0	1.622421	2.109655
AGR	0.448518	0.07173	6.25	0	0.307298	0.589737
lnDIST	(dropped)					
BORD	(dropped)					
_const	-7.52905	0.709199	-10.62	0	-8.92529	-6.13281

Fixed effects not reported
R-sq: within = 0.5391
between = 0.4949
overall = 0.4766

Model 3. System GMM dynamic panel-data estimates results, one-step

	Coef.	Robust Std. Err.	t	P>|t|	95% Conf. Interval	
lnEXP	0.671173	0.041205	16.29	0	0.587021	0.755326
lnGDP	0.225238	0.037735	5.97	0	0.148172	0.302303
BORD	-0.01643	0.0184	-0.89	0.379	-0.054	0.02115
lnDIST	0.022357	0.011031	2.03	0.052	-0.00017	0.044886
AGR	0.116916	0.040381	2.9	0.007	0.034447	0.199385
itaarg	-0.52355	0.048904	-10.71	0	-0.62343	-0.42367
itaau	-0.07718	0.014536	-5.31	0	-0.10687	-0.04749
itaaus	-0.59115	0.053107	-11.13	0	-0.69961	-0.48269
itabe	-0.12298	0.012957	-9.49	0	-0.14944	-0.09652
itabra	-0.56261	0.058553	-9.61	0	-0.68219	-0.44303
itacan	-0.61411	0.058609	-10.48	0	-0.7338	-0.49441
Itachi	-0.59026	0.058292	-10.13	0	-0.70931	-0.47122
Itacz	-0.18112	0.016696	-10.85	0	-0.21521	-0.14702
itaden	-0.43307	0.034041	-12.72	0	-0.50259	-0.36354
Itafin	-0.53817	0.037141	-14.49	0	-0.61402	-0.46232
itagre	-0.05461	0.018931	-2.88	0.007	-0.09327	-0.01595
Itahk	-0.10139	0.056957	-1.78	0.085	-0.21771	0.014931
Itaire	-0.41111	0.033986	-12.1	0	-0.48052	-0.3417
Itajap	-0.82373	0.088673	-9.29	0	-1.00483	-0.64264
Itako	-0.61231	0.054372	-11.26	0	-0.72335	-0.50126
itamex	-0.64476	0.060426	-10.67	0	-0.76817	-0.52135
itaneth	-0.213	0.016704	-12.75	0	-0.24711	-0.17888
itanor	-0.59946	0.049449	-12.12	0	-0.70044	-0.49847
itapol	-0.1689	0.018959	-8.91	0	-0.20762	-0.13018
itapor	-0.16105	0.019008	-8.47	0	-0.19987	-0.12223
Itaru	-0.37804	0.041359	-9.14	0	-0.46251	-0.29357
itaspa	-0.08019	0.013996	-5.73	0	-0.10877	-0.05161
itaswe	-0.4288	0.032444	-13.22	0	-0.49505	-0.36254
itaswi	-0.03458	0.011265	-3.07	0.005	-0.05759	-0.01157
Itatur	-0.08346	0.038056	-2.19	0.036	-0.16118	-0.00574
Itahun	-0.14542	0.026354	-5.52	0	-0.19924	-0.0916
Itauk	-0.11968	0.019472	-6.15	0	-0.15945	-0.07991
itausa	-0.41453	0.063271	-6.55	0	-0.54375	-0.28532

Arellano-Bond test for AR(1) in first differences: z = -2.38 Pr > z = 0.018
Arellano-Bond test for AR(2) in first differences: z = -1.52 Pr > z = 0.128

NETHERLAND

Model 1. OLS estimate results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	0.761685	0.025921	29.39	0	0.710675	0.812695
lnDIST	-0.53649	0.047417	-11.31	0	-0.6298	-0.44317
AGR	0.722094	0.103835	6.95	0	0.517754	0.926434
BORD	0.677613	0.157685	4.3	0	0.367301	0.987925
Const	2.121805	0.41449	5.12	0	1.306117	2.937493

Number of obs = 304
F(4, 299) = 440.51
Prob > F = 0.0000
R-squared = 0.8549
Adj R-squared = 0.8530
Root MSE = 0.52145

Model 2. Fixed effects (within) regression estimates results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	2.155737	0.112038	19.24	0	1.935162	2.376312
AGR	0.437781	0.064451	6.79	0	0.310893	0.564669
lnDIST	(dropped)					
BORD	(dropped)					
_const	-9.8629	0.646127	-15.26	0	-11.135	-8.59083

Fixed effects not reported

R-sq: within = 0.6434
between = 0.3495
overall = 0.3553

Model 3. System GMM dynamic panel-data estimates results, one-step

	Coef.	Robust Std. Err.	t	P>|t|	95% Conf. Interval	
lnEXP	0.647451	0.098824	6.55	0	0.445625	0.849278
lnGDP	0.988561	0.283985	3.48	0.002	0.408587	1.568536
BORD	-3.33309	1.120062	-2.98	0.006	-5.62057	-1.04562
lnDIST	-0.41926	0.126561	-3.31	0.002	-0.67773	-0.16078
AGR	0.162359	0.051133	3.18	0.003	0.057931	0.266786
netharg	-1.25413	0.353893	-3.54	0.001	-1.97688	-0.53138
nethau	-1.40866	0.482852	-2.92	0.007	-2.39477	-0.42254
nethaus	-1.1763	0.355814	-3.31	0.002	-1.90297	-0.44963
nethbe	1.698957	0.526782	3.23	0.003	0.623125	2.774788
nethbra	-1.98012	0.597301	-3.32	0.002	-3.19997	-0.76027
nethcan	-2.00516	0.604125	-3.32	0.002	-3.23895	-0.77137
nethcin	-2.01388	0.626043	-3.22	0.003	-3.29243	-0.73533
nethcz	-0.56619	0.199313	-2.84	0.008	-0.97324	-0.15913
nethden	-1.39292	0.461076	-3.02	0.005	-2.33456	-0.45128
Nethfin	-0.81683	0.302154	-2.7	0.011	-1.43391	-0.19975
Nethfra	-2.99304	0.986206	-3.03	0.005	-5.00714	-0.97893
nethgre	-0.70649	0.245927	-2.87	0.007	-1.20875	-0.20424
Nethhk	-0.24589	0.164972	-1.49	0.147	-0.58281	0.091024
Nethire	-0.69344	0.244121	-2.84	0.008	-1.192	-0.19488
Nethjap	-3.41237	1.035071	-3.3	0.003	-5.52626	-1.29847
Nethko	-1.48123	0.471642	-3.14	0.004	-2.44446	-0.51801
nethmex	-1.44489	0.426727	-3.39	0.002	-2.31638	-0.5734
Nethita	-2.51467	0.819432	-3.07	0.005	-4.18817	-0.84117
nethnor	-1.32843	0.4011	-3.31	0.002	-2.14758	-0.50927
nethpol	-1.06714	0.358042	-2.98	0.006	-1.79836	-0.33593
nethpor	-0.67201	0.239813	-2.8	0.009	-1.16177	-0.18224
Nethru	-1.72077	0.563595	-3.05	0.005	-2.87179	-0.56976
nethspa	-1.98718	0.654523	-3.04	0.005	-3.32389	-0.65047
nethswe	-1.32597	0.476957	-2.78	0.009	-2.30005	-0.3519
Nethswi	-1.83851	0.587627	-3.13	0.004	-3.0386	-0.63841
Nethtur	-0.85209	0.330637	-2.58	0.015	-1.52734	-0.17684
Nethhun	-2.32161	0.796229	-2.92	0.007	-3.94773	-0.69549
Nethuk	-0.73883	0.246628	-3	0.005	-1.24251	-0.23515
nethusa	-3.62584	1.149829	-3.15	0.004	-5.9741	-1.27758

Arellano-Bond test for AR(1) in first differences: z = -3.80 Pr > z = 0.000
Arellano-Bond test for AR(2) in first differences: z = 1.76 Pr > z = 0.079

PORTUGAL

Model 1. OLS estimate results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	1.009384	0.045736	22.07	0	0.919378	1.09939
lnDIST	-1.24254	0.114035	-10.9	0	-1.46695	-1.01812
AGR	0.487614	0.161192	3.03	0.003	0.170396	0.804833
BORD	-0.17741	0.362084	-0.49	0.625	-0.88998	0.535151
Const	4.501457	0.997941	4.51	0	2.537553	6.465362

Number of obs = 303
F(4, 298) = 190.33
Prob > F = 0.0000
R-squared = 0.7187
Adj R-squared = 0.7149
Root MSE = 0.96767

Model 2. Fixed effects (within) regression estimates results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	2.486821	0.24787	10.03	0	1.998817	2.974826
AGR	0.162706	0.142769	1.14	0.255	-0.11838	0.443788
lnDIST	(dropped)					
BORD	(dropped)					
_const	-14.1193	1.441301	-9.8	0	-16.9569	-11.2817

Fixed effects not reported

R-sq: within = 0.2915
between = 0.3635
overall = 0.3487

Model 3. System GMM dynamic panel-data estimates results, one-step

	Coef.	Robust Std. Err.	t	P>|t|	95% Conf. Interval	
LnEXP	0.591657	0.133426	4.43	0	0.319166	0.864148
lnGDP	1.375392	0.424529	3.24	0.003	0.508387	2.242397
lnDIST	-0.67772	0.205296	-3.3	0.002	-1.09699	-0.25845
AGR	-0.26445	0.196636	-1.34	0.189	-0.66604	0.137133
BORD	-2.84128	1.139099	-2.49	0.018	-5.16763	-0.51493
porarg	-1.78114	0.682697	-2.61	0.014	-3.17539	-0.38688
Porau	-1.70213	0.66607	-2.56	0.016	-3.06243	-0.34183
poraus	-1.61601	0.670635	-2.41	0.022	-2.98563	-0.24639
Porbe	-1.43539	0.697385	-2.06	0.048	-2.85964	-0.01114
porbra	-2.80994	1.051581	-2.67	0.012	-4.95755	-0.66232
porcan	-2.87114	1.022981	-2.81	0.009	-4.96035	-0.78194
Porchi	-3.61404	1.174723	-3.08	0.004	-6.01315	-1.21494
Porcz	-0.51001	0.203507	-2.51	0.018	-0.92563	-0.09439
porden	-1.02257	0.535215	-1.91	0.066	-2.11562	0.070488
Porfin	-0.79111	0.430615	-1.84	0.076	-1.67054	0.088327
Porfra	-3.46722	1.317207	-2.63	0.013	-6.15732	-0.77713
porgre	-0.93653	0.408012	-2.3	0.029	-1.7698	-0.10326
Porhk	-0.73335	0.414673	-1.77	0.087	-1.58023	0.113524
Porire	-0.58217	0.321721	-1.81	0.08	-1.23922	0.074868
porger	-3.74264	1.422167	-2.63	0.013	-6.64709	-0.83819
Porjap	-5.12405	1.699645	-3.01	0.005	-8.59519	-1.65291
Porko	-2.86654	0.922395	-3.11	0.004	-4.75032	-0.98276
pormex	-2.42833	0.836322	-2.9	0.007	-4.13633	-0.72033
porneth	-1.90827	0.82575	-2.31	0.028	-3.59468	-0.22187
Pornor	-1.19465	0.584287	-2.04	0.05	-2.38792	-0.00138
Porpol	-1.55131	0.537848	-2.88	0.007	-2.64974	-0.45288
Porru	-3.11432	1.009589	-3.08	0.004	-5.17618	-1.05247
Porita	-3.50189	1.245341	-2.81	0.009	-6.04522	-0.95857
porswe	-1.42885	0.655185	-2.18	0.037	-2.76691	-0.09078
porswi	-2.31494	0.890013	-2.6	0.014	-4.13259	-0.49729
Portur	-1.64675	0.652185	-2.52	0.017	-2.97869	-0.31481
Porhun	-2.792	1.132349	-2.47	0.02	-5.10457	-0.47944
Poruk	-0.18929	0.181342	-1.04	0.305	-0.55964	0.181057
porusa	-5.423	1.912812	-2.84	0.008	-9.32949	-1.51652

Arellano-Bond test for AR(1) in first differences: z = -2.12 Pr > z = 0.034
Arellano-Bond test for AR(2) in first differences: z = 1.09 Pr > z = 0.277

SPAIN

Model 1. OLS estimate results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	0.816305	0.032774	24.91	0	0.751811	0.8808
lnDIST	-0.51392	0.08716	-5.9	0	-0.68543	-0.3424
AGR	0.581553	0.141423	4.11	0	0.30325	0.859855
BORD	1.387637	0.182043	7.62	0	1.0294	1.745874
Const	1.266975	0.767607	1.65	0.1	-0.24358	2.77753

Number of obs = 306
F(4, 301) = 240.60
Prob > F = 0.0000
R-squared = 0.7618
Adj R-squared = 0.7586
Root MSE = 0.68065

Model 2. Fixed effects (within) regression estimates results

	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval	
lnGDP	2.697903	0.186592	14.46	0	2.330561	3.065245
AGR	0.546693	0.10755	5.08	0	0.33496	0.758427
lnDIST	(dropped)					
BORD	(dropped)					
_const	-13.6683	1.073369	-12.73	0	-15.7814	-11.5552

Fixed effects not reported

R-sq: within = 0.5025
between = 0.4385
overall = 0.4140

Model 3. System GMM dynamic panel-data estimates results, one-step

	Coef.	Robust Std. Err.	t	P>|t|	95% Conf. Interval	
LnEXP	0.647485	0.064614	10.02	0	0.515525	0.779445
LnGDP	0.856286	0.345466	2.48	0.019	0.15075	1.561821
BORD	-0.10826	0.477752	-0.23	0.822	-1.08396	0.867445
LnDIST	-0.38677	0.155564	-2.49	0.019	-0.70448	-0.06907
AGR	0.108268	0.038144	2.84	0.008	0.030367	0.186169
spaarg	-0.31856	0.423523	-0.75	0.458	-1.18351	0.54639
Spaau	-1.01365	0.618551	-1.64	0.112	-2.27689	0.249604
spaaus	-0.85841	0.514429	-1.67	0.106	-1.90901	0.192197
Spabe	-0.90285	0.664449	-1.36	0.184	-2.25984	0.454138
spabra	-1.34056	0.819208	-1.64	0.112	-3.01361	0.332487
spacan	-1.56964	0.813628	-1.93	0.063	-3.23129	0.092008
spacin	-1.5024	0.811535	-1.85	0.074	-3.15977	0.154977
Spacz	-0.03527	0.177178	-0.2	0.844	-0.39712	0.326575
spadan	-0.92442	0.522595	-1.77	0.087	-1.9917	0.142861
Spafin	-0.6478	0.385154	-1.68	0.103	-1.43439	0.138787
spafra	-1.69918	0.75183	-2.26	0.031	-3.23462	-0.16374
spagre	-0.38408	0.363962	-1.06	0.3	-1.12739	0.359226
Spahk	-0.04886	0.243872	-0.2	0.843	-0.54691	0.449193
Spaire	-0.34498	0.291993	-1.18	0.247	-0.94131	0.251348
spager	-2.18172	1.322471	-1.65	0.109	-4.88257	0.519124
Spajap	-2.74124	1.367371	-2	0.054	-5.53378	0.051304
Spako	-1.31468	0.657442	-2	0.055	-2.65736	0.027994
spamex	-0.57695	0.515136	-1.12	0.272	-1.629	0.475096
spaneth	-1.12827	0.777815	-1.45	0.157	-2.71678	0.46024
spanor	-0.74947	0.454039	-1.65	0.109	-1.67675	0.177797
Spapol	-0.61815	0.433444	-1.43	0.164	-1.50336	0.26706
Sparu	-1.35625	0.756638	-1.79	0.083	-2.90151	0.18901
Spaita	-1.77725	1.121065	-1.59	0.123	-4.06677	0.512274
spasve	-0.94521	0.60027	-1.57	0.126	-2.17112	0.280709
spasvi	-1.38688	0.754514	-1.84	0.076	-2.92781	0.154044
spatur	-0.4058	0.465663	-0.87	0.39	-1.35681	0.545207
spaun	-1.6189	1.057368	-1.53	0.136	-3.77834	0.540529
spauk	-0.11141	0.178421	-0.62	0.537	-0.4758	0.252971
spausa	-2.90811	1.572649	-1.85	0.074	-6.11989	0.303666

Arellano-Bond test for AR(1) in first differences: z = -3.15 Pr > z = 0.002
Arellano-Bond test for AR(2) in first differences: z = -1.70 Pr > z = 0.089

REFERENCES

Anderson J.and E. van Wincoop E. (2003) “Gravity with gravitas: A solution to the border puzzle”, *American Economic Review*, 93, 1, 170-192.

Anderson T.W. and C. Hsiao (1981) “Estimation of Dynamic Models with Error Components”, *Journal of the American Statistical Association*, 76, 598-606.

Arellano M. and S. Bond (1991) “Some Tests of Specification for Panel Data: Monet Carlo Evidence and a Application to Employment Equations”, *Review of Economic Studies*, 58, 277-297.

Arellano M. and O. Bover (1995) “Another look at the instrumental variable estimation of error-components models”, *Journal of Econometrics*, 68, 29-51.

Baldwin R. (1994), *Towards an Integrated Europe*, CEPR, London.

Baltagi B.H. (2001) *Econometric Analysis of Panel Data*, John Wiley and Sons, New York.

Blundell R. and S. Bond (1998) “Initial condition and moment restrictions in dynamic panel data models”, *Journal of Econometrics*, 68, 29-51.

Bond S. (2002), “Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice”, *working paper* 09/02 Institute for Fiscal Studies, London.

Brenton P. and F. Di Mauro (1999), “The Potential Magnitude and Impact of FDI Flows to CEECs”, *Journal of Economic Integration*, 14, 1.

Bun M. and F. Klaassen (2002) “The Importance of Dynamics in Panel Gravity Models of Trade”, discussion Paper presented at the European Economic Association Meeting, Venice, August 22, 2002.

De Grauwe P. and F. Skudelny (2000) “The Impact of EMU on Trade Flows”, *Weltwirtshaftliches Archiv*, 136, 381-402.

de Nardis S. and C. Vicarelli (2003), “Currency Union and Trade: The Special Case of EMU”, *Weltwirtshaftliches Archiv*, 139, 4.

Disdier A.C. and K. Head (2003), "Exaggerated Reports on the Death of Distance: Lessons from a Meta-Analysis", *mineo*.

Egger P. (2000a), "A Note on the Proper Specification of the Gravity Equation", *Economic Letters*, 66, 381-402.

Egger P. (2000b), "European Exports and Outward Foreign Direct Investment: a Dynamic Panel Data Approach", *WIFO Working Paper*, 129.

Egger P. (2002), "An econometric view on estimation of gravity models and the calculation of trade potential", *The World Economy*, 25, 2, 297–312.

Eichengreen B. and D. Irwin (1997), "The role of history in bilateral trade flows", in: *The Regionalization of the World Economy*, Frankel J., ed., University of Chicago Press, 33-57.

Evenett S. and W. Keller (2002), "On theories explaining the success of the gravity model", *Journal of Political Economy,*, 110, 281-316.

Gros D. and Gonciarz A. (1996), "A note on the trade potential of Central and Eastern Europe", *European Journal of Political Economy*, 12, 709-721.

Hamilton C.B. and A.L. Winters (1992), "Opening Up International Trade with Eastern Europe", *Economic Policy*, 14, 77-116.

International Trade Center (2003), "TradeSim. A Gravity Model for the Calculation of Trade Potentials for Developing Countries and economies in transition", Technical report, *UNCTAD* - WTO.

Matyas L. (1997), "Proper Econometric Specification of the Gravity Model", *The World Economy*, 20, 3, 363-368.

Matyas L. (1998) "The Gravity Model: Some Econometric Consideration", *The World Economy*, 21, 3, 397-401.

Melitz J. (2001), "Geography, trade and currency unions", *CEPR Discussion Paper*, 2987.

Nickell S. (1981), "Biases in dynamic Models with Fixed Effects", *Econometrica*, 49, 1417-1426.

Nilsson L. (2000), "Trade integration and the EU economic membership criteria", *European Journal of Political Economy*, 16, 807-827.

Rivera S.A. (2003), "Key Methods for Quantifying the Effecs of Trade Liberalization", Technical Report 3583, *International Economic Review* - US International Trade Commission.

Rose A. and E. van Wincoop (2001), "National money as a barrier to international trade: The real case for currency union", *American Economic Review*, 91, 2, 386-390.

UNCTAD (1999), "UNCTAD's contribution to the implementation of the united nations new agenda for the development of Africa in the 1990s: African transport infrastructure, trade and competitiveness", Technical report, UNCTAD, report by the *UNCTAD* Secretariat. TD/B/46/10.

Wang Z. and A.L.Winters (1992), "The Trading Potential of Eastern Europe", *Journal of Economic Integration*, 7, 113-136.