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SCHRIFTEN DER GESELLSCHAFT FÜR WIRTSCHAFTS- UND SOZIALWISSENSCHAFTEN DES LANDBAUES E.V.

Fedoseeva, S.: The BRICs of the Eurozone's Agri-Food Exports: An Empirical Assessment of Trade-Driving Factors. In: Kühl, R., Aurbacher, J., Herrmann, R., Nuppenau, E.-A., Schmitz, M.: Perspektiven für die Agrar- und Ernährungswirtschaft nach der Liberalisierung. Schriften der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues e.V., Band 51, Münster-Hiltrup: Landwirtschaftsverlag (2016), S. 41-50.

Schriften der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues e.V., Bd. 51, 2016, S. 41 – 50

# THE BRICS OF THE EUROZONE'S AGRI-FOOD EXPORTS: AN EMPIRICAL ASSESSMENT OF TRADE-DRIVING FACTORS

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**Abstract**

In 2013, BRICs jointly outperformed the US – Eurozone's main trading partner in agri-food goods – in terms of imports of agricultural production. The importance of the BRIC states in the international market is undeniable: high price volatility on a coffee market caused by frosts in Brazil, price peaks due to an increasing demand of Chinese population for milk or effects of the Russian import ban are just some illustrations to this statement. Nevertheless, while European exports to the US have been extensively studied, exports to the BRIC countries have been rather neglected, which is surprising given that BRICs' markets are more dynamic and less saturated, implying that classic trade determinants – including exchange rates pass-through – might differ in their magnitude from those typically found for developed markets such as the US. This paper fills the gap in the literature and shows that trade elasticities differ not only between the BRICs and the US, but also across individual BRICs.

**Keywords**

Agricultural exports, BRIC, Eurozone, export elasticity, NARDL, single currency.

## 1 Introduction

Eurozone exports to the BRIC countries experience some sort of boom in the recent years. Not only the monetary value of exports has drastically increased, exports to the BRICs proved to be stable to major economic turbulences. For instance, during the global financial crisis exports to the BRIC states allowed some European countries to compensate for declining sales volumes in countries that were more heavily affected by the crisis than emerging markets (POPLAWSKI 2013). Such development of aggregated exports can be observed for individual Eurozone states too. The most remarkable example is Germany, whose total exports to the BRICs increased sevenfold over the last fifteen years (DIE WELT 2012). Agri-food exports to the BRICs follow this pattern. The BRIC states have even outperformed the US in terms of agri-food imports from Europe in 2013 (Figure 1).

BRICs are important world market players, both on the supply and the demand side. It does not take a crystal globe to observe that frosts in Brazil result in high coffee prices. Chinese demand for milk products that caused a sharp increase in the world market prices earlier in 2007 (PASCOE 2015) and then in 2013 (STEGER 2014) or the effect of the Russian boycott on food imports from Europe are just a few recent reminders the BRICs' importance on the demand side of the international market.

The role of the BRIC countries is expected to increase[2] even further in the future, as stagnation of the European demand pushes exporters to look for new destinations for their goods, shifting the focus away from the intra-European market (KOEPPEN 2013) and searching for alternatives for such saturated markets as the US. Searching for new markets becomes even more important due to an extension of the Russian import embargo, which might turn BRICs

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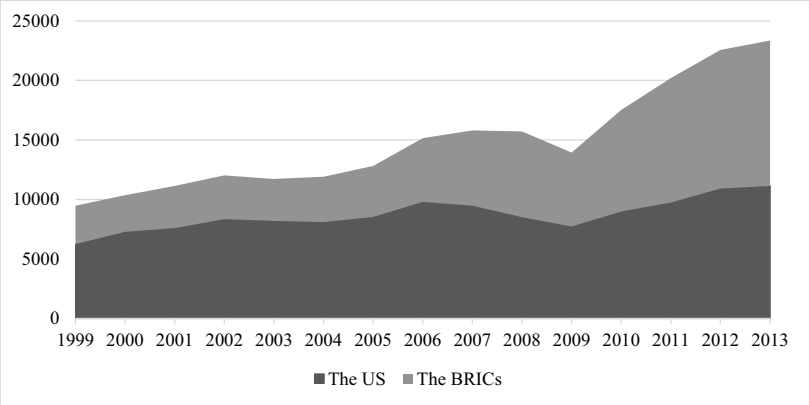
[2] This development is expected to be heterogeneous across individual BRICs though (e.g. JACOBS and ROSSEM 2014)

to the BICs for the case of Eurozone's agri-food exports as exporters fear that there will be no easy re-entry once they are squeezed out the market (CASSIDY 2014).

**Figure 1: Eurozone's agri-food exports to the BRIC states and the US, million Euro**




Source: Own presentation with Eurostat data

As European food exporters anticipate the troubles that might be brought by their absence on the Russian market, they might consider actively targeting some other emerging markets instead. For instance, China's role in Eurozone's exports has been rapidly increasing in the last years and it is expected to continue rising despite an overall slowdown of the Chinese economy (SANDERSON 2015). Finally, Brazil and India, whose roles in Eurozone agri-food exports are still very modest, have all the chances to become the future engines of European exports growth, should the policy makers undertake necessary steps in facilitating trade with these countries.

The growing role of the BRIC countries for the Eurozone's agri-food exports and a lack of empirical analysis of their determinants underline the focus of this study. This paper builds on a classic reduced-form export demand model enhanced by introducing an asymmetric impact of the exchange rate on exports not only in the short but also in the long run. A very few empirical studies that apply similar framework to study export determinants, focus on European exports to the US. VERHEYEN (2013) concentrates on total exports and Fedoseeva (2014) focuses on the agricultural exports. Both studies find evidence in favour of asymmetric cointegration between European exports and the EUR/USD exchange rate. Different reactions of exports to Euro appreciations and depreciations are explained in these studies by an application of (asymmetric) pricing strategies (e.g. pricing-to-market in a sense of KRUGMAN 1987)that are driven by a high degree of market saturation and a fierce competition for market shares in the American market that makes European exporters squeeze mark-ups to smooth exchange rate fluctuations. However, these studies did not differentiate between the prior- and post-Euro periods, thus the asymmetric effects of the exchange rate could be due to differences in nominal exchange rates prior to the Euro. This shortcoming is addressed in this article. Finally, the BRIC countries are different from the US. They are still on their way to satisfaction of the increasing demand and they have different sources of substituting the European goods once they become less affordable due to changes in macro factors. This implies that the role of standard trade determinants – foreign demand, relative prices and exchange rates – might differ from the patterns that are typically observed for the case of developed saturated

import markets. Understanding the difference between driving forces of Eurozone exports to the BRICs and to the US might help policymakers to facilitate trade in the regions that even facing a downturn grow faster than developed economies.

## 2 Empirical Methodology

The empirical specification used in this study builds on a classic reduced-form export demand model (as in e.g. BAHMANI-OSKOOEE and KARA 2003). I start by assuming that the long-run relationship between the log of real agricultural exports of the Eurozone to a BRIC country $y_{j,t}$, the log of relative prices (inflation home over foreign), $p_{j,t}$, the log of a nominal exchange rate (units of a BRIC's currency per 1 Euro), $e_{j,t}$, and the log of foreign demand, $i_{j,t}$, can be expressed with a following linear model:

(1) $y_{j,t} = a_{0,j} + a_{1,j}p_{j,t} + a_{2,j}e_{j,t} + a_{3,j}i_{j,t} + u_{j,t}$

where *j* is a country subscript and *t* is a time subscript.

If all the variables of Eq. (1) share the same order of integration (I(1)) and if residuals of Eq. (1) are stationarity, $a_{1,t}$, $a_{2,t}$ and $a_{3,t}$ represent long-term elasticities of exports with respect to relative prices, exchange rate and foreign demand, respectively. The short-term dynamics and the speed of adjustment to a long-run equilibrium can be assessed by means of an error-correction model:

(2) $\Delta y_{j,t} = \lambda_j u_{j,t-1} + \sum_{n=1}^{\psi} \gamma_{j,n}\Delta y_{j,t-n} + \sum_{n=0}^{\omega}\left(\rho_{1,j,n}\Delta p_{j,t-n} + \rho_{2,j,n}\Delta e_{j,t-n} + \rho_{3,j,n}\Delta i_{j,t-n}\right) + \varepsilon_{j,t}$

where $\lambda$ is the error-correction term that is expected to belong to the interval (-1; 0). If $\lambda$ =1, the adjustment to long-run equilibrium is immediate. If $\lambda$ is equal to 0, no long-run relationship between variables exist and only short-term dynamics can be estimated. $\lambda$ outside of the (-1; 0) interval suggests no cointegration between variables. γ and ρ are coefficients that refer to short-term dynamics. For instance, $\rho_{1,j,0}$ is the impact elasticity of exports with respect to changes in relative prices and $\rho_{2,j,0}$ and $\rho_{3,j,0}$ are contemporaneous reaction of exports to exchange rate changes and to changes in foreign demand, respectively.

The main shortcoming of a two-stage ECM is pushing short-term dynamics in a residual term of a long-run equation (BANERJEE 1998) and a weak power of unit root tests, especially in short samples (LARUE 2004). To avoid these limitations, this two-stage ECM can be substituted by a single-step auto-regressive distributed lag model (ARDL) as proposed by PESARAN and SHIN (1999):

(3) $\Delta y_{j,t} = a_{0,j} + \lambda_j y_{j,t-1} + \varphi_{1,j}p_{j,t-1} + \varphi_{2,j}e_{j,t-1} + \varphi_{3,j}i_{j,t-1} + \sum_{n=1}^{\psi}\gamma_{j,n}\Delta y_{j,t-n} + \sum_{n=0}^{\omega}\left(\rho_{1,j,n}\Delta p_{j,t-n} + \rho_{2,j,n}\Delta e_{j,t-n} + \rho_{3,j,n}\Delta i_{t-n}\right) + \xi_{j,t}$

with $\lambda$, γ and $\rho$ having the same interpretation as above and the long-term elasticities obtained from Eq. (3) as follows:

(4) $a_{1,j} = -\frac{\varphi_{1,j}}{\lambda_j};\ a_{2,j} = -\frac{\varphi_{2,j}}{\lambda_j};\ a_{3,j} = -\frac{\varphi_{3,j}}{\lambda_j}.$

Estimating an ARDL model allows us using the bounds testing approach of PESARAN ET AL. (2001) to test for cointegration even when variables are of different orders of integration: I(0), I(1) or mixed.

Eqs. (1-3) assume that exports symmetrically respond to positive and negative developments of independent variables. For instance, that implies that Eurozone's exports react the same way to Euro appreciations as they react to Euro depreciations. Recent empirical studies, however, suggest that this assumption is too strict and does not hold in reality. Although most of the empirics dealt exclusively with short-term asymmetries, a new wave of trade literature targets the long-run asymmetry as well (see e.g. VERHEYEN 2013). These studies employ non-

linear ARDL (NARDL) approach proposed by SHIN ET AL. (2014) that allows assessing asymmetric cointegration: a relationship between the dependent variable and positive and negative partial sum processes of independent variables in the long run. The basic idea behind this partial sum decomposition can be traced down to HOUCK (1977) and SCHORDERET (2001):

(5) $e_{j,t} = e_{j,0} + e_{j,t}^{+} + e_{j,t}^{-}$

where $e_{j,0}$ is the value of $e_j$ at time $t_0$, $e_{j,t}^{+}$ and $e_{j,t}^{-}$ are partial sum processes of positive and negative changes of *e* respectively:

(6) $e_{j,t}^{+} = \sum_{n=1}^{t} \Delta e_{j,n}^{+} = \sum_{n=1}^{t} \max(\Delta e_{j,n}, 0)$

(7) $e_{j,t}^{-} = \sum_{n=1}^{t} \Delta e_{j,n}^{-} = \sum_{n=1}^{t} \min(\Delta e_{j,n}, 0)$

Substitution of the exchange rate in Eq. (3) by its partial sum processes results in the following NARDL specification, in which long- and short-term asymmetry is allowed:

(8) $\Delta y_{j,t} = \beta_{0,j} + \lambda_j y_{j,t-1} + \varphi_{1,j} p_{j,t-1} + \varphi_{2,j}^{+} e_{j,t-1}^{+} + \varphi_{2,j}^{-} e_{j,t-1}^{-} + \varphi_{3,j} i_{j,t-1} + \varphi_{4,j} t_j + \sum_{n=1}^{\psi} \gamma_{j,n} \Delta y_{j,t-n} + \sum_{n=0}^{\omega} \left( \rho_{1,j,n} \Delta p_{j,t-n} + \rho_{2,j,n}^{+} \Delta e_{j,t-n}^{+} + \rho_{2,j,n}^{-} \Delta e_{j,t-n}^{-} + \rho_{3,j,n} \Delta i_{j,t-n} \right) + \xi_{j,t}$

In this final specification also trend ($t_j$ ) is added as export series reveal a clear tendency to grow over time. Here $\beta_{0,j}$ is a new constant: $\beta_{0,j} = a_{0,j} + e_{0,j}$, and lag orders $\psi$ and $\omega$ determined by means of the BIC information criterion individually for each BRIC country. The maximum number of considered lags is twelve, though empirical part will show that parsimonious models were chosen.

The asymmetric long-run coefficients for export elasticities with respect to exchange rates in Eq. (8) can be calculated as:

(9) $a_{2,j}^{+} = -\frac{\varphi_{2,j}^{+}}{\lambda_j}; a_{2,j}^{-} = -\frac{\varphi_{2,j}^{-}}{\lambda_j}.$

Cointegration between variables is assessed by means of the Bounds testing approach by PESARAN ET AL. (2001). The test consists of running an F-test of the form $\lambda_j = \varphi_{1,j} = \varphi_{2,j}^{+} = \varphi_{2,j}^{-} = \varphi_{3,j} = 0$ and comparing the test statistic with critical values provided in PESARAN ET AL. (2001). A conservative number of regressors (k=3) is chosen for the test, although the model includes four explanatory variables after the decomposition of exchange rate variables (see SHIN ET AL. (2014) for a discussion). Finally, the (a)symmetry is tested by means of an F-test as follows: $\varphi_{2,j}^{+} = \varphi_{2,j}^{-}$ and $\rho_{2,j,n}^{+} = \rho_{2,j,n}^{-}$ for the long and the short term coefficients, respectively.

Previous studies suggest that exports decrease with relative prices and increase with foreign demand, with income elasticities rarely exceeding the value of one for the case of exports to developed countries (DEMIAN and DI MAURO 2015; VERHEYEN 2013). As for the exchange rate, exports are typically expected to grow with a depreciation of a national currency and decline with its appreciation. For the case of the exports to the US, VERHEYEN (2013) and FEDOSEEVA (2014) suggest that European exports increase to a larger extent due to Euro depreciations than they decrease due to Euro appreciations.

## 3 Data

Data used in this study are monthly and cover the period from January 1999 to December 2013. Agricultural and food exports are defined as exports of three subgroups of the Standard International Trade Classification (SITC) that include SITC 0 – Food and live animals, SITC 1 – Beverages and tobacco and SITC 4 – Animal and vegetable oils, fats and waxes.

Exports are measured in Euro. They are deflated with a GDP deflator for the Eurozone and seasonally adjusted by means of the Census-12 procedure. Exchange rates are measured as units of local currency per 1 Euro and are taken from Eurostat or from respective Central Banks. Relative prices are obtained by dividing the Eurozone's harmonised price index by a consumer price index (CPI) of a respective BRIC country. Foreign demand is approximated by the index of industrial production (IIP) of each destination country. Export data are taken from Eurostat, while the GDP deflator, CPIs and IIPs come from the OECD database. Some descriptive statistics related to values of Eurozone's agri-food exports in Euro (not deflated and not seasonally adjusted) are summarized in Table 1.

**Table 4: Descriptive statistics**

| **Exports to:** | Brazil | Russia | India | China |
|---|---|---|---|---|
| Mean | 51498114 | 346120325 | 10705909 | 108845587 |
| Median | 37918131 | 312046100 | 9162662 | 58665443 |
| Maximum | 150462115 | 649690135 | 36654477 | 425498368 |
| Minimum | 16799552 | 115191628 | 2090744 | 11178807 |
| Std. Dev. | 28173559 | 135234292 | 6942432 | 109001806 |
| Observations | 180 | 180 | 180 | 180 |

Source: Own computations.

## 4 Results

Table 2 provides an overview of results from the estimated NARDL models. For all the four models, Bounds testing rejected the hypothesis of a no long-run relationship between level variables. This implies that variables in the models are cointegrated and there exists a long-run relationship between exports and their determinants. The deviations from the long-run equilibrium correct at a speed of 42-56% per month.

**Table 2: NARDL outcomes**

| | Brazil | | Russia | | India | | China | |
|---|---|---|---|---|---|---|---|---|
| Constant, $\beta_{0,j}$ | 9.82 | *** | 10.70 | *** | 9.24 | *** | 7.18 | *** |
| | (1.80) | | (1.72) | | (1.78) | | (1.35) | |
| Export(-1), $\lambda_j$ | -0.56 | *** | -0.56 | *** | -0.50 | *** | -0.42 | *** |
| | (0.10) | | (0.09) | | (0.10) | | (0.08) | |
| Prices(-1), $\varphi_{1,j}$ | -0.12 | | 0.01 | | -2.13 | *** | -2.31 | ** |
| | (0.71) | | (0.19) | | (0.57) | | (0.70) | |
| Euro appreciation(-1), $\varphi_{2,j}^{+}$ | -0.65 | *** | -0.75 | *** | -0.92 | | -0.13 | |
| | (0.17) | | (0.18) | | (0.95) | | (0.35) | |
| Euro depreciation(-1) $\varphi_{2,j}^{-}$ | 0.05 | | -0.34 | ** | 2.26 | *** | -0.48 | ** |
| | (0.12) | | (0.17) | | (0.78) | | (0.21) | |
| Foreign demand(-1), $\varphi_{3,j}$ | 0.70 | | 0.77 | | 13.83 | * | 2.41 | |
| | (0.66) | | (0.62) | | (7.91) | | (2.88) | |
| Trend, $\varphi_{4,j}$ | 0.01 | *** | 0.01 | *** | 0.01 | | 0.00 | |
| | (0.00) | | (0.00) | | (0.02) | | (0.00) | |
| ΔPrices, $\rho_{1,j,0}$ | -0.97 | | -1.73 | | -2.13 | | -1.39 | |
| | (2.05) | | (1.25) | | (2.81) | | (1.43) | |
| ΔEuro appreciation, $\rho_{2,j,0}^{+}$ | -0.51 | | -0.52 | | -3.69 | ** | -0.65 | |
| | (0.40) | | (0.41) | | (1.66) | | (0.95) | |
| ΔEuro depreciation, $\rho_{2,j,0}^{-}$ | -0.18 | | 0.30 | | 2.86 | | -0.54 | |
| | (0.53) | | (0.46) | | (2.57) | | (0.97) | |
| ΔForeign demand, $\rho_{3,j,0}$ | 0.30 | | 2.43 | | 16.46 | | 1.41 | |
| | (0.70) | | (2.87) | | (16.13) | | (2.42) | |
| ΔExport(-1), $\gamma_j$ | -0.18 | *** | | | -0.21 | | -0.29 | *** |
| | (0.07) | | | | (0.09) | ** | (0.07) | |
| Adj. R-squared | 0.33 | | 0.27 | | 0.32 | | 0.32 | |
| F-statistic | 9.03 | | 7.65 | | 8.54 | | 8.42 | |
| Prob(F-stat) | 0.00 | | 0.00 | | 0.00 | | 0.00 | |
| Bounds test (F-stat) | 7.49 | | 7.87 | | 6.14 | | 5.89 | |
| LM (Prob.$\chi^2(12)$)$^x$ | 0.07 | | 0.20 | | 0.11 | | 0.03 | |
| Reset (Prob.)$^x$ | 0.95 | | 0.07 | | 0.20 | | 0.50 | |
| **Long-run elasticities** | | | | | | | | |
| Prices, $a_{1,j}$ | -0.21 | | 0.02 | | -4.23 | *** | -5.47 | *** |
| | (1.27) | | (0.34) | | (0.87) | | (1.51) | |
| Euro appreciations, $a_{2,j}^{+}$ | -1.17 | *** | -1.35 | *** | -1.83 | | -0.32 | |
| | (0.23) | | (0.25) | | (1.75) | | (0.72) | |
| Euro depreciations, $a_{2,j}^{-}$ | 0.09 | | -0.62 | ** | 4.50 | *** | -1.13 | *** |
| | (0.22) | | (0.29) | | (1.53) | | (0.41) | |
| Foreign demand, $a_{3,j}$ | 1.27 | | 1.37 | | 27.50 | | 5.71 | |
| | (1.21) | | (1.08) | | (16.48) | | (7.57) | |
| Symmetry, long run$^x$ | 0.01 | | 0.01 | | 0.03 | | 0.46 | |
| Symmetry, short run$^x$ | 0.69 | | 0.23 | | 0.06 | | 0.94 | |

Source: Own computations. Notes: ***, **, * refers to statistical significance at 1, 5 and 10 percent level. White standard errors are in parentheses. + indicates the p-value of the associated statistic. LM: Breusch-Godfrey serial correlation LM test. Reset: Ramsey RESET test. Long-run elasticities are obtained as indicated in Eq. (4) and

(9). Critical values for bounds testing approach for the case V: Unrestricted intercept and trend (k=3) are [4.01; 5.07] at 5% level according to PESARAN ET AL. (2001). $H_0$ of no long-run relationship between level variables of NARDL is rejected for all models.

The outcomes are generally in line with theoretical expectations: exports are positively related to foreign demand (if we consider only the sign of the coefficient) and negatively – to relative prices and Euro appreciations. For Euro depreciations a negative coefficient is expected since there are only negative values in these series, hence a negative coefficient implies that exports increase in Euro depreciations. Trend has a positive impact on exports, although trend coefficients are only significant in cases of Brazil and Russia. The hypothesis of a long-run symmetry of effects of Euro appreciations and depreciations on exports was rejected for all BRIC states, but China. Short-run dynamics seem to be less important for Eurozone's exports to the BRICs, only one short-run coefficient is significant across all four estimated models.

The outcomes obtained for individual countries are very heterogeneous. Relative prices negatively affect Eurozone exports to China and India, while these exports are not affected by nominal Euro appreciations in the long run. The situation for Brazil and Russia is just the opposite: exports are not affected by changes in inflation but decline with Euro appreciations. This finding has straightforward implication for trade with these countries now that both Rouble and Real are facing problems brought up by declining oil prices and are rapidly devaluating against other currencies. On the other hand, exports to Russia and to China tend to grow with depreciating Euro. Exports to China react elastically to a 1% Euro depreciation (although the exchange rate pass-through is very close to 1), while exports to Russia react rather inelastically. This might be due to a relative saturation of the Russian market that has long historical ties with Europe. In any case, the impact of Euro appreciations and depreciations on Eurozone's exports to BRICs is not uniform across countries. The discrepancies between currency devaluations and revaluations are also obvious. These asymmetries between Euro appreciations and depreciations and across BRIC countries remain once real exchange rates are considered instead of nominal exchange rates and relative prices. This is an important finding, as earlier empirical literature on exports to emerging countries did not consider a possibility of a long-run asymmetric impact of exchange rates on trade.

Finally, the results suggest that the Eurozone exports to the BRICs do not react to changes in foreign demand. This finding differs from earlier empirical studies that consider foreign demand as one of the most important trade determinants; especially for exports to emerging countries whose demand for quality goods tends to grow with increasing wealth (see e.g. HALLAK 2006). A few reasons for not significant outcomes come to mind: first, previous studies often focused on bilateral trade at the country level and the effect of e.g. Chinese demand on German exports (see POPLAWSKI 2013) might be blurred by considering Eurozone as a whole. The presence of Eurozone's goods on the BRIC markets is still very moderate and growing demand might be rather satisfied by increasing imports from countries outside of Eurozone (e.g. BRICs intra-trade). Especially the European penetration of Indian and Brazilian agricultural markets is very modest which calls forth bringing the work on trade agreements with these countries back to life. Finally, the effect of the foreign demand might also be asymmetric and assuming the opposite results in a misspecification of the model.

All in all, the results draw a more mixed picture of trade determinants relevant for North-South trade than suggested by previous literature on this subject. This deviation could result from differences in economic development of individual BRIC countries over the last years. Since previous studies were mostly conducted in the late 1980s (e.g. MARQUEZ and MCNEILLY 1988) and concentrated on the analysis of a little data spans and aggregated exports, it is quite complicated to compare the outcomes. Finally, the Eurozone considered as the exporter to the

BRIC states is a new source of aggregation. Not only the BRICs are different in their development patterns, also individual Eurozone members are very heterogeneous.

Comparing the results with findings of recent studies that addressed the asymmetry of the exports' reactions to Euro appreciations and depreciations reveals certain differences between exports to the US and to the BRICs. While for the US market it has been often found that European exporters benefit from the depreciating Euro to a higher extend than the exports decrease due to Euro appreciation, the picture looks completely different for the BRICs. Exports to Russia and Brazil are negatively affected by a strong Euro in the long run and exports to India react immediately. The negative impact of Euro appreciations on exports is higher in absolute terms than a positive impact of Euro depreciations on exports for the case of BRICs. Higher saturation of American market (income effect) and a fierce competition that European products face in the US (changes in relative prices and exchange rate pass-through) combined with a desire of European exporters to stay active in the market might be a reason for that. The difficulties related to keeping the market position in the US market once sunk costs of entry are paid might result in strategic pricing of European exporters in the sense of local currency price stabilization in line with KNETTER (1993) as was suggested by VERHEYEN (2013). This explanation might also be true for the Eurozone exports to China as exports only grow in Euro depreciations while appreciations are not passed through. Given the rapid increase in Eurozone exports to China in the recent years, smoothing exchange rate shocks might well be a part of the European exporters' strategy employed in order to gain a market share on a Chinese market. The exports to the other BRICs markets are sensitive to changes in prices and exchange rates since European presence is still negligible on these markets (especially India and Brazil) and hence easily substitutable. The situation might change should the Eurozone exporters be able to find their niche on the BRIC markets and turn BRICs into core markets, not periphery. Searching for new markets becomes especially relevant given the general slowdown of the world economy and the difficulties that the Eurozone exporters face in light of the Russian import ban imposed in August 2014. Relaunching the discussion on trade agreements with India and the Latin American countries might provide the European producers new markets for their goods and release a pressure on domestic prices.

## 5 Concluding remarks

The motivation for this study was called forth by an increasing role that emerging markets, including the BRIC states, play in the international agri-food trade and in exports of the Eurozone. BRIC countries are not only large suppliers of raw products (e.g. Brazil and its exports of coffee beans and sugar); they are also very important players on the demand side of the international market (e.g. the role of Asian consumers in rising chocolate prices, see e.g. STROM 2015). Rapid (even in its down turn) growth of China and India (BRADSHER 2015) and hopefully forthcoming reforms in Brazil that will bring the country on a path of sustainable development, promise to fulfil the forecasts of those who believed in the BRICs becoming the engines of the world's growth (FOLLATH 2013). Russia, that still is a very important export market for some agri-food exporters of the Eurozone and that plays a role of a 'bad guy' since August 2014 by imposing an import boycott on some goods, set European exporters on fire in their search for alternative markets for their products. Given that Russia accounted for a huge part of Eurozone's agricultural and food exports, finding a new comparably large market might not be such an easy task. Here, the other B(R)IC states might step in, as their demand for quality food products is expected to keep growing in the future (SANDERSON 2015). This is plausible, since even in their depression times emerging markets tend to grow on average at higher rates than the industrialized countries (e.g. TALLEY 2015). This observation needs to be carefully considered by policy makers that might for instance facilitate the trade agreements

with India (initiated in a faraway 2007) and work on reducing the hurdles on the way of Eurozone agri-food products to a rapidly developing Indian market.

Much more discussion might be brought up as individual European countries and their exports are considered (or probably individual products). One is, however, clear: emerging countries are different from well-established and saturated European and American markets, where variety, brands and market power play a huge role in determining trade flows. Emerging markets are still of the way to satisfying their demand and integrating in the global market. Their consumption patterns and import-driving factors are unique across the countries within the block and need to be carefully considered by those who plan to include BRICs to a list of their destination countries. Not only understanding of the difference between BRICs and developed countries is important, but also the large discrepancies between individual BRIC states needs to be taken into account by exporters planning to operate in these markets.

## Literature


BAHMANI-OSKOOEE, M. (1986): Determinants of international trade flows. The case of developing countries. In: Journal of Development Economics 20: 107-123.

BAHMANI-OSKOOEE, M. and O. KARA (2003): Relative responsiveness of trade flows to a change in prices and exchange rate. In: International Review of Applied Economics 17: 293-308.

BANERJEE, A.J., J.J. DOLANDO and R. MESTRE (1998): Error-correction mechanism tests for cointegration in a single equation framework. In: Journal of Time-Series Analysis 19: 267-285.

BRADSHER, K. (2015): As rivals falter, India's economy is surging ahead. In: The New York Times. February 18, 2015. Available at: http://nyti.ms/1CFWgX.

CASSIDY, N. (2014): Russia sanctions: Poland's apple growers feel the squeeze. In: BBC News: Business. August 24, 2014. Available at: http://www.bbc.com/news/business-28879165.

CHATTERJEE, B., P.C. JENA and S. SINGH (2014): Intra-BRICS trade and its implications for India. Discussion Paper. Centre for International Trade, Economics & Environment. Jaipur, India. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2474078.

DEMIAN, C.-V., and F. DI MAURO (2015). The exchange rate, asymmetric shocks and asymmetric distributions. European Central Bank (ECB), Working Paper 1801.

DIE WELT (2012) Exporte in BRIC-Staaten haben sich versiebenfacht. In: Die Welt. August 29, 2012. Available at: http://www.welt.de/wirtschaft/article108854722/Exporte-in-BRIC-Staaten-haben-sich-versiebenfacht.html.

FEDOSEEVA, S. (2014): Are agri-food exports any special? Exchange rate nonlinearities in European exports to the US. In: German Journal of Agricultural Economics 63: 259-270.

FOLLATH, E. (2013): Goldman Sachs' Jim O'Neill: BRICS 'Have exceeded all expectations'. In: Spiegel Online. Available at: http://www.spiegel.de/international/business/departing-goldman-sachs-exec-still-sees-bright-future-for-bric-nations-a-890194.html

HALLAK, J.C. (2006): Product quality and the direction of trade. In: Journal of International Economics 68: 238-265.

HOUCK, P.J. (1977): An approach to specifying and estimating non-reversible functions. In: American Journal of Agricultural Economics 59: 570-572.

JACKOBS, L.M. and R. VAN ROSSEM (2014): The BRIC phantom: A comparative analysis of the BRICs as a category of rising powers. In: Journal of Policy Modeling 36: 47-66

KNETTER, M.M. (1993): International comparisons of pricing-to-market behavior. In: The American Economic Review 83: 473-86.

KOEPPEN, N (2012): German companies look far beyond ailing Euro zone. In: The Wall Street Journal. Available at: http://www.wsj.com/articles/SB100014241278873 2433920457 8171171589846946.

KRUGMAN, P. (1987): Pricing to market when the exchange rate changes. In: ARNDT S.W., and RICHARDSON J.D. (Eds.) Real-financial linkages among open economies. Cambridge: MIT Press: 49-70.

LARUE, B. (2004): Pricing-to-market: Simple theoretical insights, formidable econometric challenges. In: Canadian Journal of Agricultural Economics 52: 387-398.

MARQUEZ, J. and C. MCNEILLY (1988): Income and price elasticities for exports of developing countries. The Review of Economics and Statistics 70: 306-314.

PASCOE, M. (2015): Tears ahead for China-driven milk boom in New Zealand. In: The Sydney Morning Herald. January 4, 2015. Available at: http://www.smh.com.au/business/tears-ahead-for-chinadriven-milk-boom-in-new-zealand-20150104-12hiwq.html.

PESARAN M.H. AND Y. SHIN (1999): An autoregressive distributed lag modelling approach to cointegration analysis. In: Strom, S. (Ed). Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium Cambridge: Cambridge University Press.

PESARAN, M.H., Y. SHIN and R.J. SMITH (2001): Bounds testing approaches to the analysis of level relationships. In: Journal of Applied Econometrics 16: 289-326.

POPLAWSKI, K. (2013): Chasing globalisation: Germany's economic relations with the BRIC countries. Centre for Eastern Studies Report. Warsaw, Poland. Available at: http://www.osw.waw.pl/en/public acje/osw-report/2013-11-25/chasing-globalisation-germanys-economic-relations-bric-countries.

SANDERSON, H. (2015): Commodities explained: China's new normal. In: Financial Times. February 23, 2015. Available at: http://www.ft.com/intl/cms/s/2/a76d3010-b69a-11e4-95dc-00144feab7de. html#axzz3SxllquaS.

SCHORDERET, Y (2001): Revisiting Okun's law: A hysteretic perspective. Discussion Papers, Department of Economics, University of California, San Diego, USA.

SHIN, Y., B. Yu and M.-J. GREENWOOD-NIMMO (2014): Modelling asymmetric cointegration and dynamic multipliers in a nonlinear ARDL framework. In: HORRACE W.C., and SICKLES R.C. (Eds.) Festschrift in honor of Peter Schmidt. Springer Science & Business Media, New York: 281-314.

STEGER, B. (2014): China's milk demand squeezes global supply. In: The Wall Street Journal. April 11, 2014. Available at: http://blogs.wsj.com/economics/2014/04/11/chinas-milk-demand-squeezes-global-supply.

STROM, S. (2015): Valentine's day chocolate will cost more this year, as cocoa prices rise. In: The New York Times. February 11, 2015. Available at: http://nyti.ms/1FAxqIY.

TALLEY, I. (2015): World Bank cuts 2015 Global growth forecast to 2.8%. In: The Wall Street Journal. June 10, 2015. Available at: http://on.wsj.com/1JFWfID.

VERHEYEN, F. (2013): Exchange rate nonlinearities in EMU exports to the US. In: Economic Modelling 32 (C): 66-76.