

**Título:** ESSAYS ON THE ESTIMATION OF THE EURO EFFECT ON TRADE

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**Resumen:** The European integration process has raised a wide debate about its cost and benefits since its very inception and the debate on its advantages and disadvantages has growing parallel to the Union. In this dissertation we aim to contribute to this literature in several manners. First, an empirical strategy to compare estimation methods is suggested and a thorough revision of the main factors affecting trade is performed, including the effect of the exchange rate (ER) level and volatility. Second, we improve the specification and estimation of the gravity equation, allowing for the presence of cross section dependencies, nonstationarities and structural breaks in the data as well as deterministic and stochastic trends. Finally, we investigate the impact of the euro both at the aggregate level and on each one of its members. We repeat this analysis for European Monetary Union (EMU) trade with third countries to explore the existence of potential diversion effects. This thesis is structured into four chapters. In chapter 2, we focus on the study of the gravity equation, which is the main empirical tool employed in the literature to predict trade flows across countries. However, several

problems related with its empirical application still remain unsolved. The unobserved heterogeneity, the presence of heteroskedasticity in trade data or the existence of zero flows, which make the estimation of the logarithm unfeasible, are some of them. This chapter provides a survey of the most recent literature concerning the specification and estimation methods for this equation. Using a dataset covering 80% of world trade, the most widely extended estimators are compared, showing that the Heckman sample selection model performs better overall for the specification of gravity equation selected. Furthermore, it is shown that methods that do not properly treat the presence of zero flows on data exhibit noticeably worse performance than the rest in terms of efficiency. On the other hand, nonlinear estimators show more accurate results and are robust to the presence of heteroskedasticity.

In chapter 3 we address the impact that ER variables have on trade; an aspect frequently ignored in the estimation of the euro effect on trade. We estimate a gravity equation including the level and volatility of real exchange rate (RER) in order to capture the additional effect the euro could have had apart from the one coming from the elimination of the volatility. We find that the elimination of the volatility boosted export per se, especially before 1999. Then, the possibility to peg to the euro could boost trade with third countries and between those third countries. Our results show that the common currency has had a positive impact on intra-EMU exports. Though, it has reduced Eurozone's imports from third countries while it had not a significant impact on Eurozone's exports to other countries. Central and Eastern European (CEE) countries represent an exception since both their exports to EMU and imports from EMU have been boosted by euro. The analysis for individual EMU members reveals the existence of a good deal of variation in the effect of the euro across member countries. Concerning the impact of the euro over time, it significantly boosted intra-EMU trade starting in 1999, with this effect reaching its maximum in the 2003-2005 period.

In chapter 4, a further step is reached. We focus on the long-run estimation of the euro effect. We reduce the previous dataset to 26 OECD countries and we estimate the equation using two sets of variables: first, one defined as it is standard in the gravity equation literature, and a second one built according to the criticisms stated by Baldwin and Taglioni (2006) (BT henceforth). From a methodological point of view, we apply panel tests that account for the presence of cross-section dependence as well as discontinuities in the non-stationary panel data. We test for cointegration between the variables and efficiently estimate the long-run relationships using the new Continuously Updated Bias Corrected (CUP-BC) and Continuously Updated Fully Modified (CUP-FM) estimators proposed in Bai et al. (2009). These estimators assume that the cross sections in the model share common sources of non-stationary variation in the form of global stochastic trends. We argue that, after controlling for cross-section dependence, deterministic trends and breaks in trade integration, the euro generate lower trade effects than predicted in previous studies.

Finally, in chapter 5 we present evidence of the long-run effect of the euro focusing on trade of the twelve initial EMU countries from a double perspective. First, we pool all the bilateral combinations of trade flows among EMU countries in a panel cointegration gravity specification. Second, we estimate a gravity equation for each member vis-à-vis the other eleven partners. Whereas the joint gravity equation provides evidence on the aggregate effect of the euro on intra-European trade, by isolating the individual countries we assess which of the member countries have obtained a larger benefit from the euro. Moreover, this strategy permits to check the robustness of the aggregate results and to find possible asymmetries. Finally, we repeat both the aggregate and individual analysis for the bilateral trade of EMU members with third countries.

