

Currency Unions and Trade: A Post-EMU Reassessment

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Motivation

- Glick-Rose (2002) used panel approach to investigate effect of currency unions on trade, using data for 1948-1997 *before* establishment of EMU
 - Found **currency unions increase trade** by **~90%**
- Current paper uses data for 1948-2013 and asks
 1. What is effect of EMU on trade?
 2. Do advances in methodology matter?

Costs and Benefits of Joining a Currency Union

Costs

- ❑ Loss of nominal exchange rate as policy tool
- ❑ Loss of national monetary policy control

Benefits

- ❑ Greater transparency of prices encourages greater competition, efficiency, and more trade
- ❑ Reduced currency risk encourages more trade and investment



Debate in Literature on Magnitude of Trade Effect of CUs

- ❑ It's big, 90-100%.
 - e.g. Glick and Rose (2002), Frankel (2010)
- ❑ It's moderate, 40-50%
 - e.g. Eicher and Henn (2011)
- ❑ It's small for the EMU, 0-20%
 - e.g. Micco et al (2003), Bun and Klaasen (2002, 2007), de Nardis and Vicarelli (2003), Flam and Nordstrom (2007), Berger and Nitsch (2008), Camarero et al (2013)
- ❑ EMU effect might even be negative
 - e.g. Baldwin and Taglioni (2007)



Preview of Findings

1. Econometric methodology matters
2. Time and country span of sample also matters
3. EMU different from other CUs:
Increases trade among EMU countries
by ~40% to 50%

Measuring Trade Effects: “Old” Methodology Gravity Model

$$\ln(\text{Trade}_{ijt}) = \gamma \text{CU}_{ijt} + \beta Z_{ijt} + \{\delta_t\} + \varepsilon_{ijt}$$

- Trade_{ijt} = average nominal value of bilateral trade between i and j at time t ,
- Z = gravity control variables, usual suspects: e.g. GDP, distance, common language, border, regional RTA, colonial history, etc. ...
- $\text{CU} = 1$ if i and j use the same currency at time t and 0 otherwise,
- $\{\delta_t\}$ = year-specific effects



Methodological Issues in Estimating γ

- ❑ Trade depends not just on bilateral factors, but also on trade with 3rd countries through “multilateral resistance” and general equilibrium effects.
- ❑ Treating all currency unions alike implicitly presumes homogeneity
- ❑ Existence of omitted variables

Measuring Trade Effects

Newer (Export) Gravity Models

- Do “theory-consistent” gravity estimation
- Use Least Squares with time-varying country dummy variables to control for multilateral resistance and other general equilibrium effects:

$$\ln(\text{Exports}_{ijt}) = \gamma \text{CU}_{ijt} + \beta \text{Z}_{ijt} + \{\lambda_{it}\} + \{\psi_{jt}\} + \varepsilon_{ijt}$$

- Exports_{ijt} = nominal value of bilateral exports from i to j at time t,
 - $\{\lambda_{it}\}$ = set of time-varying exporter dummy variables,
 - $\{\psi_{jt}\}$ = set of time-varying importer dummy variables
- Relax assumption that γ is same for all CUs

Data Set

- ❑ IMF DoTS trade: >200 “countries” 1948-2013 (with gaps) giving almost 900,000 observations
- ❑ Population, real GDP: *WDI* > PWT > IFS
- ❑ Country Characteristics: *World Factbook*
- ❑ Regional Trade Agreements (RTAs): *WTO*
- ❑ Currency Unions: Glick-Rose updated
 - 1:1 par for extended period of time (not just hard fixes)
 - Transitive: x-y and y-z imply x-z



Why We Want a Large Data Set

A large data set – spanning both countries and time

- Provides many degrees of freedom
- Allows direct comparison of effects of individual CUs, such as EMU, with others.

Gravity γ Estimates for Exports with country-year effects for exporter & importer

	All CUs	With non-EMU and EMU CUs dis-aggregated
All CUs	.51 (.02)	
All Non-EMU CUs		.76 (.02)
All EMU	Implausible!!!	-.65 (.03)
Sample period	1948-2013	1948-2013
#Obs.	879,794	879,794
#Country-year effects	22,438	22,438

Note: Other gravity regressors and year dummies included, but not reported.
Robust standard errors in parentheses.

Prefer (With-in) Fixed Pair Effect Estimator

- ❑ Exploits variation over time, answers the policy question of interest, i.e. the (time series) question
 - “What is the trade effect of a country joining (or leaving) a currency union?”
- ❑ Controls for unobserved pair effects, including potential endogeneity of currency union

Gravity γ Estimates for Exports

with country-year effects for exporter & importer
& country pair FE

	All CUs	With non-EMU and EMU CUs dis-aggregated
All CUs	.34 (.02)	
All Non-EMU CUs		.30 (.03)
EMU	$e^{.43} - 1 \sim 54\%$	← .43 (.02)
Sample period	1948-2013	1948-2013
#Obs.	879,794	879,794
#Country-year effects	22,438	22,438
#Pair FE	33,886	33,886

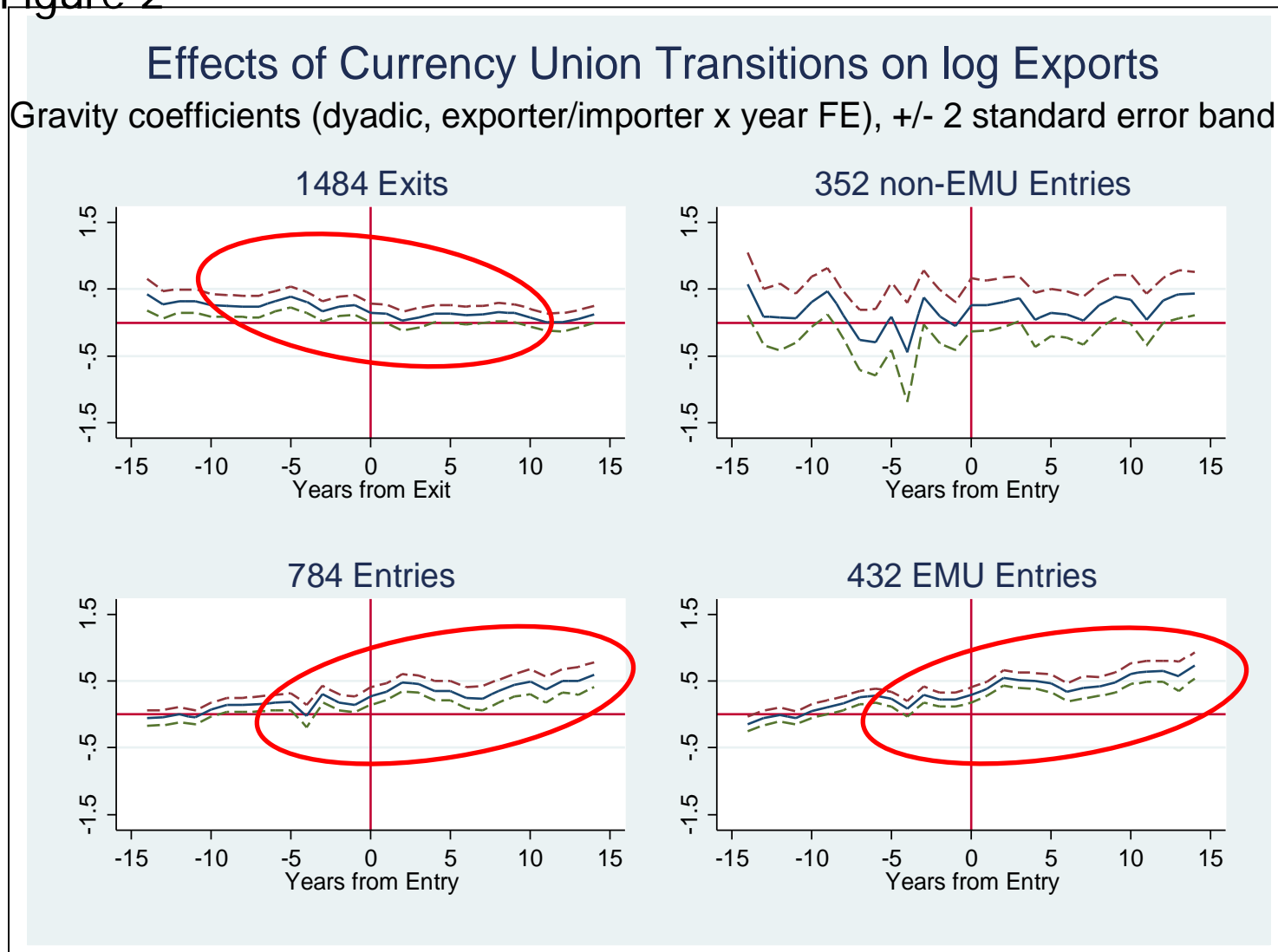
Note: Other gravity regressors and year dummies included, but not reported. Robust standard errors in parentheses.

Dynamic Effects of EMU and other CUs

- Add (14) leads and lags around time of currency union exit/entry
 - i.e. Add $\sum_k \theta_k \text{CUENTRY}_{ijt-k} + \sum_k \phi_k \text{CUEXIT}_{ijt-k}$ to gravity equation
- Permits estimation of how effect of CU entry and exit varies over time
- Allows testing whether magnitudes of effects of CU exits and entries are symmetric

Allowing Dynamic Effects, CU exit lowers exports, entry raises exports

Figure 2



Sensitivity Analysis

1. Dis-aggregate other CUs
2. Vary country and sample period
3. Disaggregate EMU effect, i.e. distinguish between “old” and “new” members
4. Take account of role of regional trade arrangements (RTAs), such as EU

1. Dis-aggregating Other CUs: Gravity γ Estimates for Exports

	γ	γ
EMU	.43** (.02)	.43** (.02)
Other CUs	.30** (.03)	-.10 (.06)
CFA Franc		.58** (.10)
ECCU \$		1.64** (.11)
Aussie \$.39 (.20)
Brit. £		.55** (.03)
French Franc		.87** (.08)
Indian Rupee		.52** (.11)
US \$		-.05 (.06)

Note: Other gravity regressors, country-year and pair dummies included, but not reported. Robust standard errors in parentheses. 879,794 annual observations, 1948-2013.

2. Varying Country and Sample Period Gravity γ EMU Estimates for Exports

	1948-2013	1995-2013	1948-2005	1985-2005	1995-2005
All Countries	.43** (.02) [879,794]	.47** (.03) [424,230]	.18** (.03) [691,074]	.18** (.03) [386,653]	.18** (.04) [235,510]
Upper Income Countries (GDP p/c > \$12,736)	.11** (.03) [75,468]	.16** (.03) [45,401]	-.02 (.04) [52,103]	-.01 (.04) [35,865]	-.09* (.04) [22,036]
Industrial Countries + Present/future EU	-.01 (.02) [73,253]	.04 (.02) [26,763]	-.09** (.03) [61,939]	-.16** (.03) [27,570]	-.07 (.04) [15,449]
Present/future EU	-.27** (.02) [30,731]	-.04 (.02) [13,337]	-.31** (.04) [25,115]	-.29** (.03) [12,230]	-.10** (.03) [7,721]

Note: dependent variable is log exports. Other gravity regressors, country-year and pair dummies included, but not reported. Robust standard errors in parentheses; no. of obs. in brackets.

3. Disaggregating EMU, and 4. Role of Regional Trade Agreements, like EU

- ❑ EMU has many “new” members, i.e. post 2006-entrants
- ❑ Many countries joined European Union (EU) in years prior to when joined EMU, e.g. 2004 “Enlargement”
- ❑ What is effect of disaggregating EMU and EU membership by distinguishing between “old” and “new” members?

Chronology of Membership in EU and EMU

Old Members

	<u>Joined EU</u>	<u>Joined EMU</u>
Belgium	1951	1999
France	1951	1999
Germany	1951	1999
Italy	1951	1999
Luxembourg	1951	1999
Netherlands	1951	1999
Ireland	1973	1999
UK	1973	
Denmark	1973	
Greece	1981	2001
Portugal	1995	1999
Austria	1995	1999
Finland	1995	1999
Spain	1995	1999
Sweden	1995	

New Members

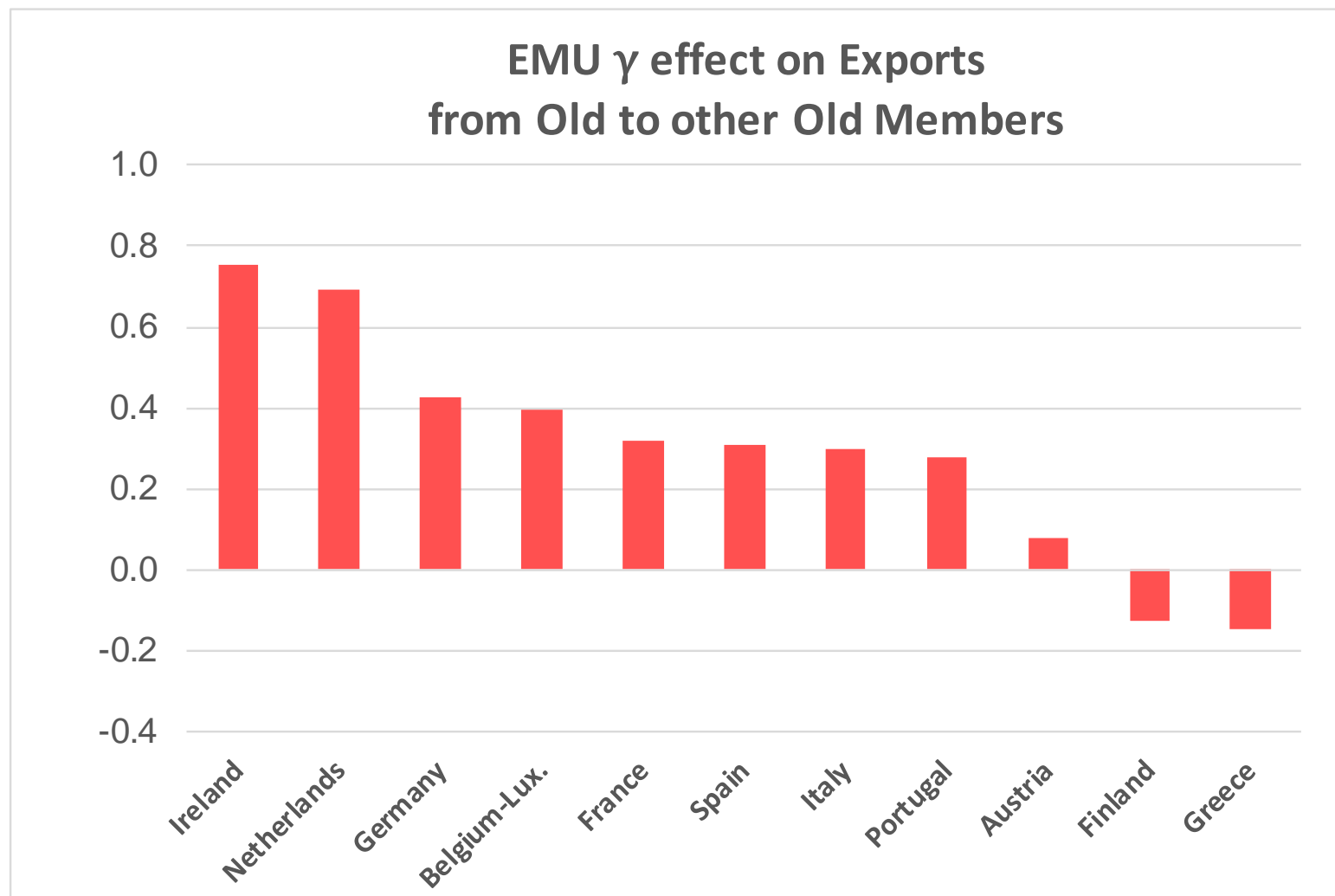
	<u>Joined EU</u>	<u>Joined EMU</u>
Slovenia	2004	2007
Cyprus	2004	2008
Malta	2004	2008
Slovakia	2004	2009
Estonia	2004	2011
Latvia	2004	2014
Lithuania	2004	2015
Czech Rep.	2004	
Poland	2004	
Hungary	2004	
Romania	2007	
Bulgaria	2007	
Croatia	2013	

3. Disaggregating EMU and EU effects Gravity γ and RTA Estimates

	EMU	EMU Dis-agg.	EMU Dis-agg. & RTA Dis-agg
Non-EMU CUs	.30 (.03)	.30 (.03)	.30 (.03)
EMU	.43 (.02)		
Old-Old EMU		.37 (.02)	.33 (.02)
New-New EMU		1.03 (.11)	.39 (.11)
Old-New EMU		.56 (.04)	-.08 (.04)
All RTAs	.39 (.01)	.39 (.01)	
Non-EU RTAs			.32 (.01)
Old-Old EU			.52 (.01)
New-New EU			1.58 (.04)
Old-New EU			1.29 (.02)

Note: Dependent variable is log exports. Other gravity regressors, French Dept. effects, country-year and pair dummies are included, but not reported.

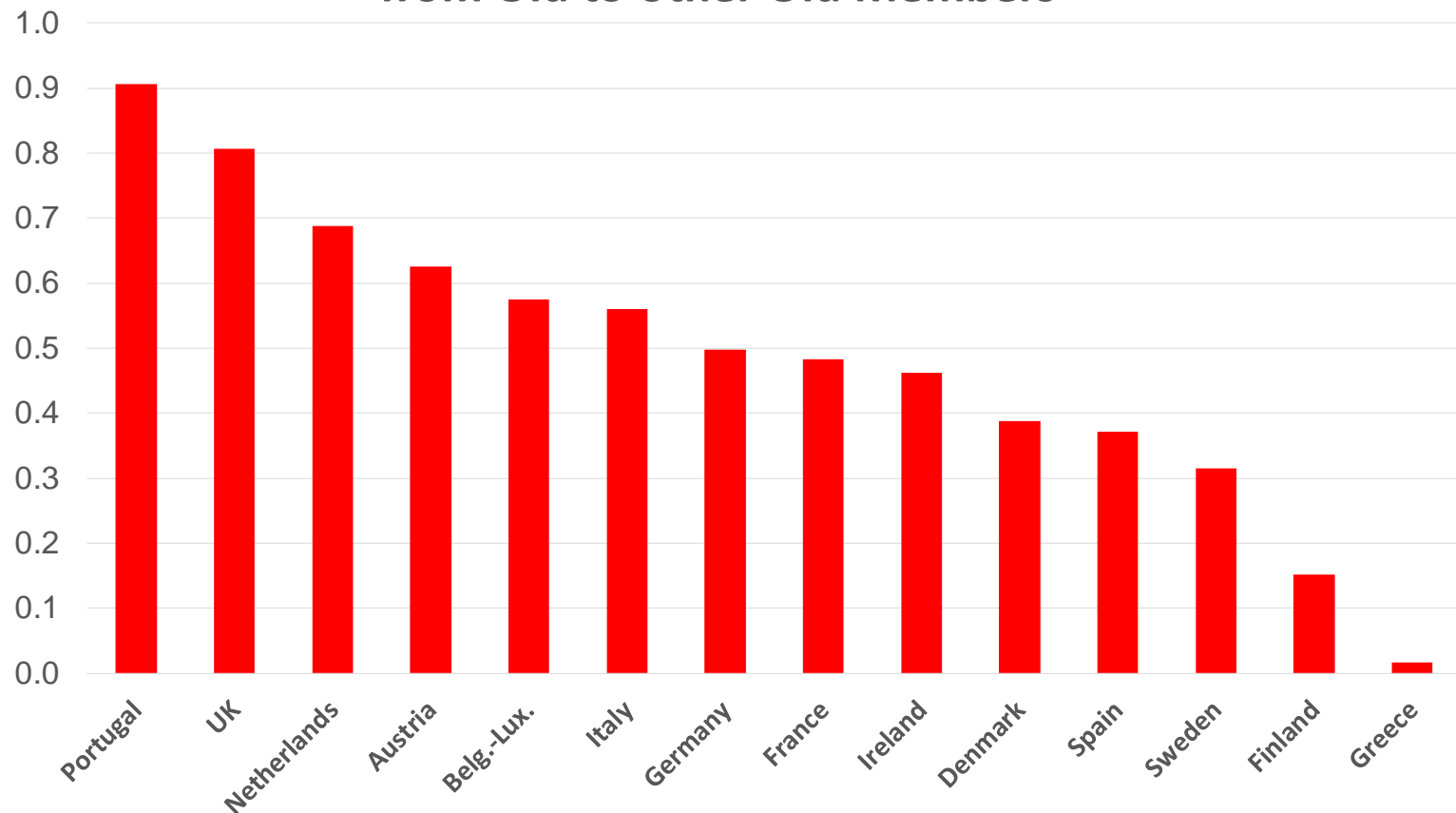
3. Disaggregating EMU effect by country: EMU effect varies across Old Members



Note: Estimates from gravity equation of (log) exports on gravity regressors, with country-year and pair dummies, and disaggregated EMU and RTA variables.

4. Disaggregating EU effect by country: EU effect varies across Old Members

EU Gravity Effect on Exports
from Old to other Old Members



Note: Estimates from gravity equation of (log) exports on gravity regressors, with country-year and pair dummies, and disaggregated EMU and RTA variables. 23

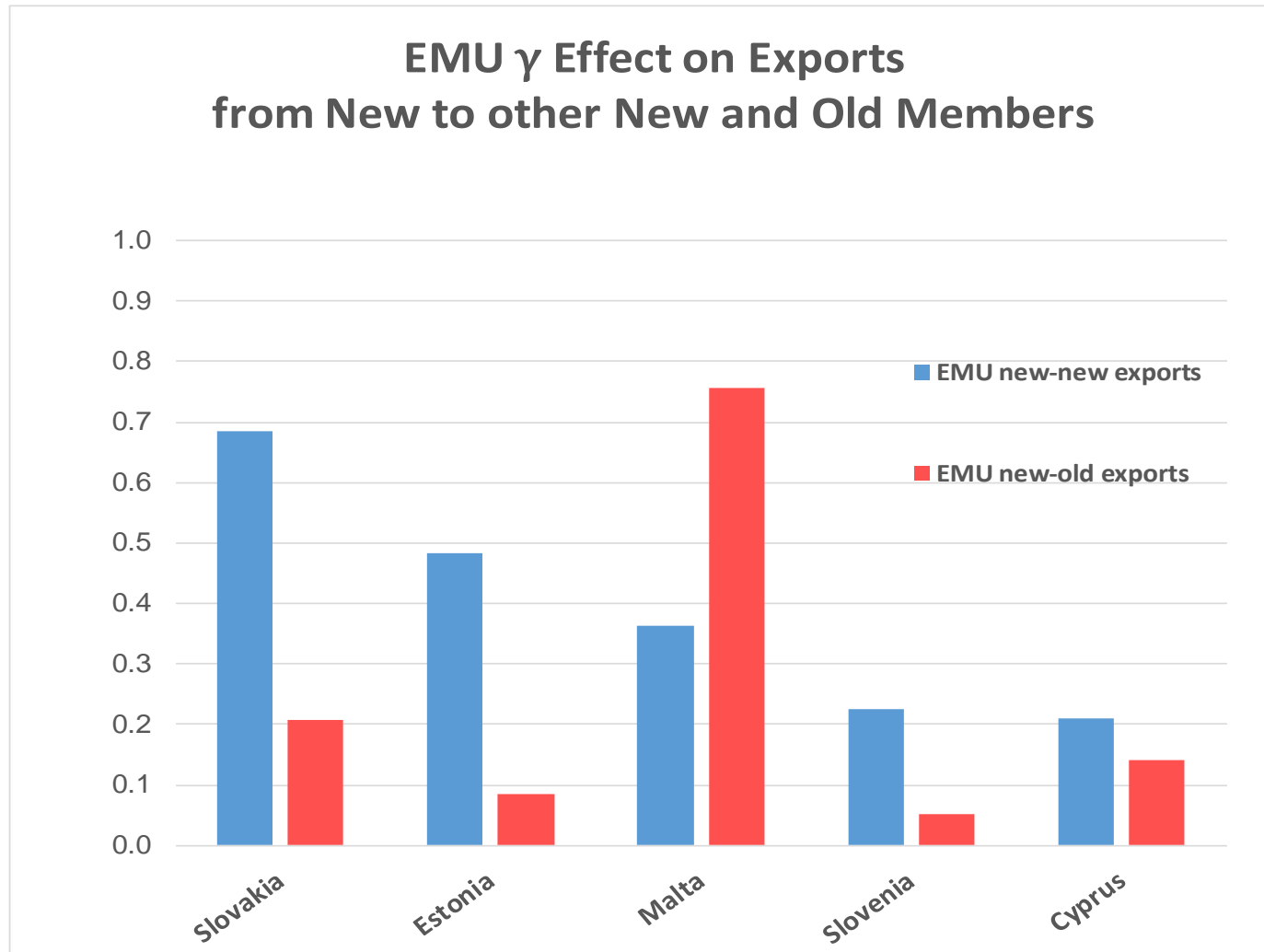


Conclusions

- ❑ Estimate gravity model specification, using panel >200 countries, 1948-2013, 15 EMU years
- ❑ Methodology and sample matter
 - Preferred methodology is panel with country-pair fixed effects
 - Preferred sample includes all countries
- ❑ EMU is different
 - EMU boosts trade by 40%- 50%
 - Other currency unions have different effects on trade
 - Only have short-time sample of EMU experience for newer (e.g. 2007-) members
- ❑ Regional trade agreements, like EU, also affect trade
 - Particularly strong for new members

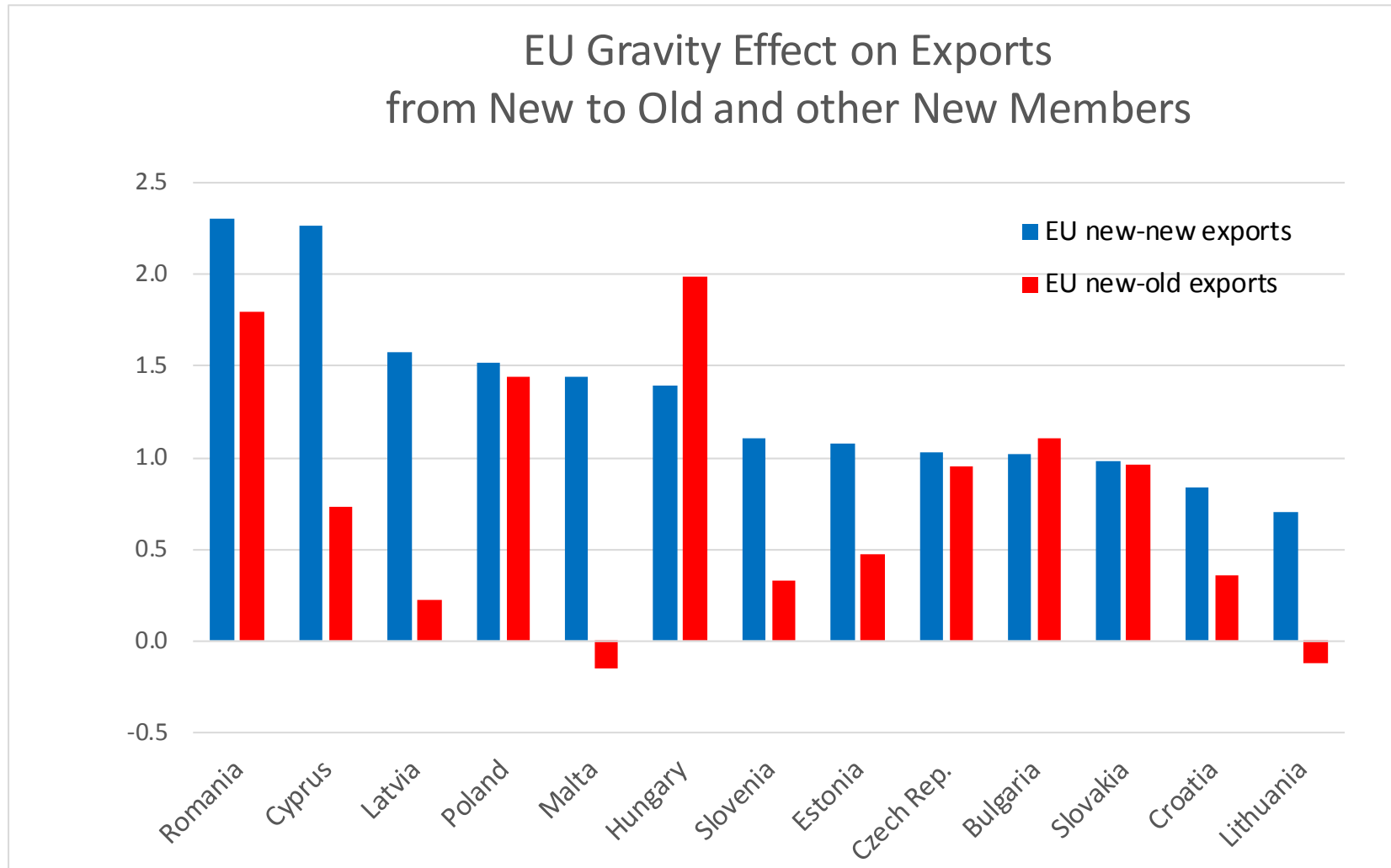
Appendix Slides

Disaggregating EMU effect by country: EMU effect varies across **New** Members



Note: Estimates from gravity equation of (log) exports on gravity regressors, with country-year and pair dummies, and disaggregated EMU and RTA variables. 26

Disaggregating EU effect by country: EU effect varies across **New** Members



Note: Estimates from gravity equation of (log) exports on gravity regressors, with country-year and pair dummies, and 27 disaggregated EMU and RTA variables.

Symmetry Tests of Entry and Exits, Exports with pair FE

Table 6	F-stat (p value)	
After CU Entry = - After CU Exit?	.8 (.71)	Can't reject
Before CU Entry = - Before CU Exit?	.8 (.68)	
Both	1.0 (.49)	
After non-EMU CU Entry = After EMU Entry?	1.3 (.17)	Can't reject
Before non-EMU CU Entry = Before EMU Entry?	1.4 (.16)	
Both	2.8 (.00)	
After non-EMU CU Exit = - After EMU Entry?	.9 (.51)	

Table reports F-test statistic for H_0 of identical slopes $\sum_k \theta_k = \sum_k \phi_k$ for given CU pairs and time periods

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