Has the Euro paid off?
A study of the trade-induced welfare effects of the EMU

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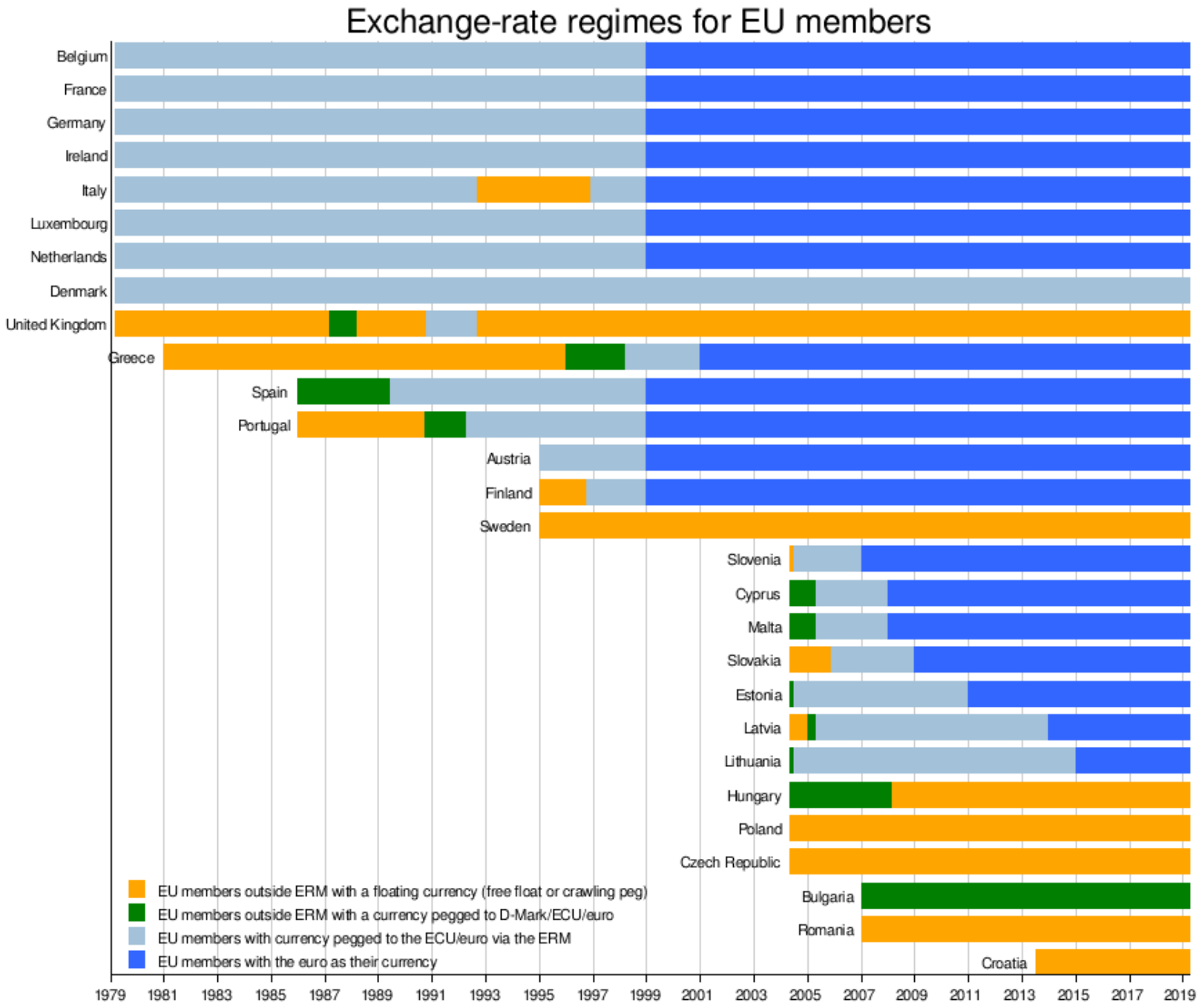
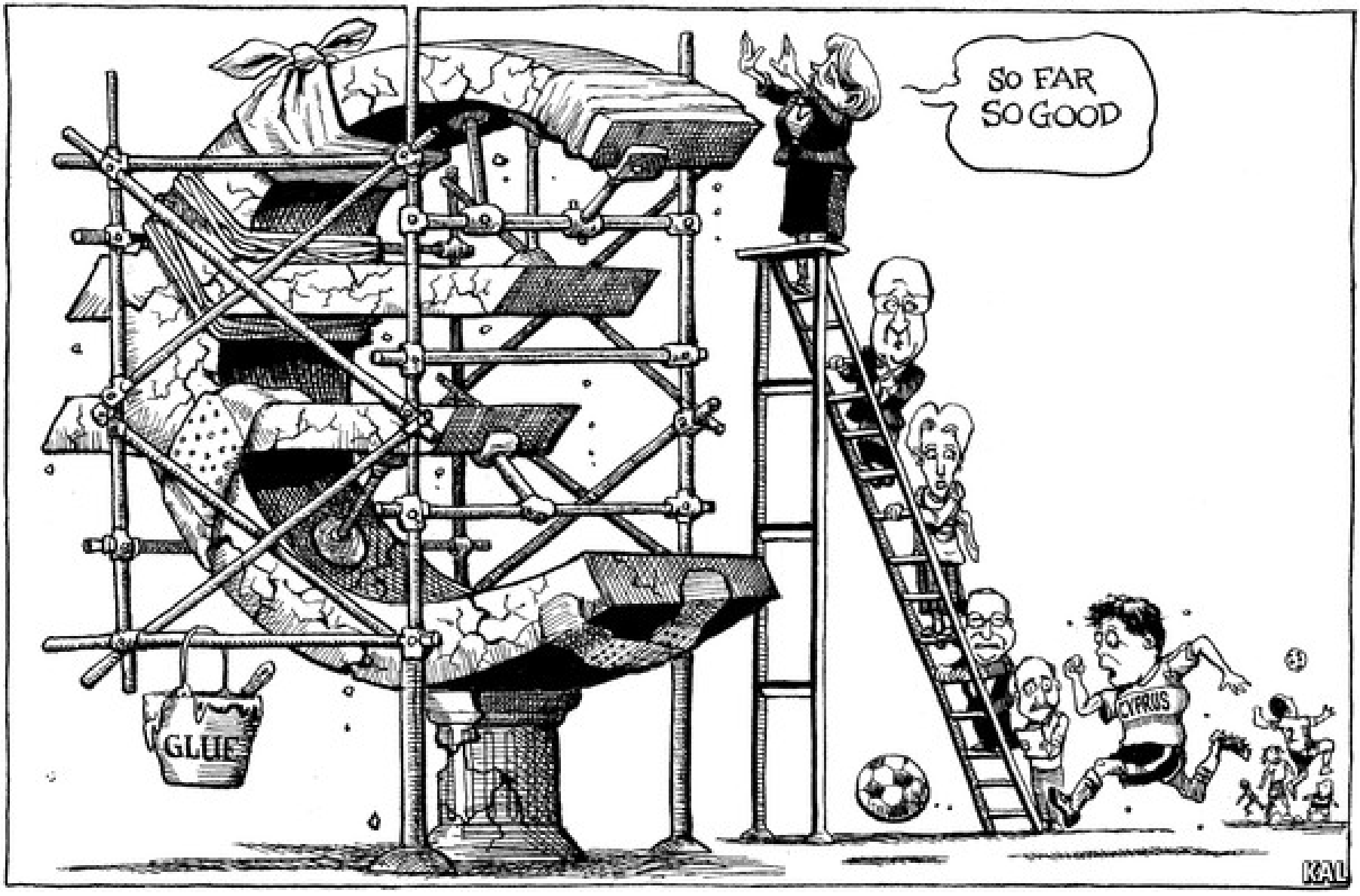
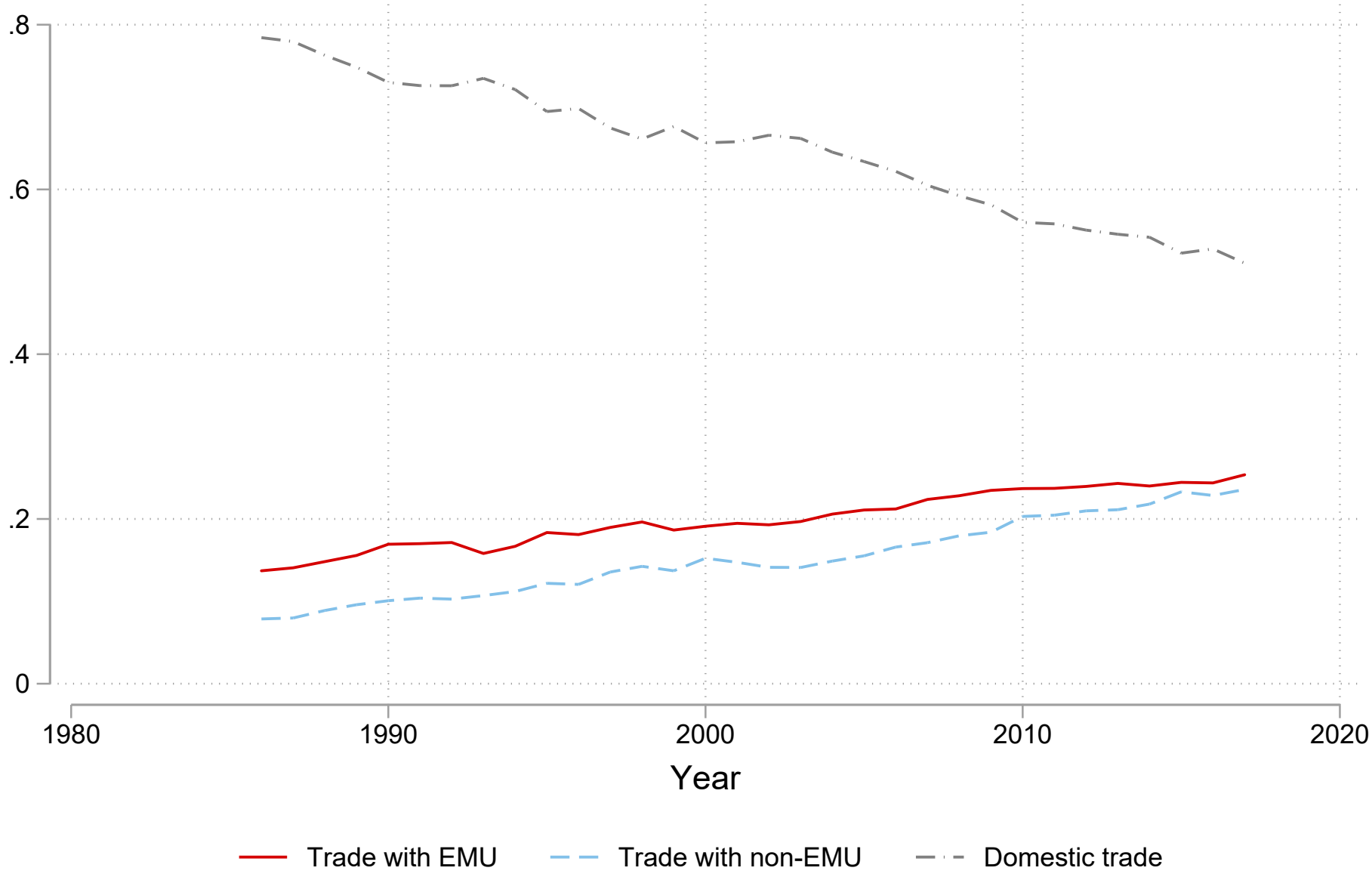

Exchange-rate regimes for EU members
Belgium
France
Germany
Ireland
Italy
Luxembourg
Netherlands
Denmark
United Kingdom
Greece
Spain
Portugal
Austria
Finland
Sweden
Slovenia
Cyprus
Malta
Slovakia
Estonia
Latvia
Lithuania
Hungary
Poland
Czech Republic
Bulgaria
Romania
Croatia
EU members outside ERM with a floating currency (free float or crawling peg)
EU members outside ERM with a currency pegged to D-Mark/ECU/euro
EU members with currency pegged to the ECU/euro via the ERM
EU members with the euro as their currency
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019

So far so good?



Trade shares



Outline

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   - CFL2: Core Multiverse
   - CFL3: Trade creation
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What do we do?

1. We re-asses the partial EMU impact on bilateral trade covering the most recent years with structural gravity
   1. The EMU has gradual effects on trade
   2. It allows considering the years after de financial and debt crisis in 2008 and 2010
2. We estimate the General Equilibrium (GE) welfare effects of the Euro with GEPPML
   1. Effects on exports
   2. Consumer prices
   3. Producer prices
   4. GDP

Yet another Euro paper?

Yes, but

- The paper adds three relevant methodological factors to the discussion of the welfare effects of the EMU

1. It uses the GEPPML recently developed by Anderson et al. (2018) to perform GE comparative static analysis of gravity models with PPML
2. It analyze trade creation/diversion effects of the EMU, providing a more accurate measure of its effect inside and outside the Eurozone
3. It studies both the effect of the level and the change over time of the EMU

GE counterfactual experiments

1. Cost of non-euro
   1. What are the overall gains from trade of the EMU?
2. Euro multiverse
   1. What are the gains from trade for core EMU countries compared to those obtained by the peripheral member countries?
3. Trade diversion/creation
   1. What are the gains from trade due to trade creation effects with countries outside the euro area?

Our findings

1. The EMU has boosted bilateral trade flows between member countries and, especially, between EMU members vis-à-vis non-member countries
    - the enlargement of the period, including the more recent years significantly raises the effect of EMU on trade
        - the overall trade creation effect of the EMU more than doubles, and the positive effect on trade with third countries is about 50 percent larger when we consider the most recent years of the sample period
2. The EMU had a sizable welfare-enhancing effect on participating countries.
    1. This effect is larger among smaller EMU members, where consumers (producers) enjoy lower (higher) prices.
    2. The lower bound estimates from our counterfactual analysis suggests that Germany's real GDP would have been about 2.16% lower than it was in 2016 if the Euro had not existed
    3. the Euro design was a second-best

Related Literature

EMU's partial effects on Trade

- Rose (2000, EP) "One money, one market: The effect of common currencies on trade"
- Glick & Rose (2002, EER) "Does a currency union affect trade? The time-series evidence"
- Glick & Rose (2016, EER) "Currency unions and trade: A post-EMU reassessment" (*Mea Culpa*)
- Rose (2017, OER) "Why do estimates of the EMU effect on trade vary so much?"
- Larch et al. (2019, OxBES) "Currency Unions and Trade: A PPML Re-assessment with High-dimensional Fixed Effects"
- Esteve et al., (2020, WE) "EMU and trade: A PPML re-assessment with intra-national trade flows"

EMU's trade's GE effects

- Felbermayr & Steininger (2019). "Revisiting the Euro's Trade Cost and Welfare Effects"

The mystery of the shrinking tables

	(1)	(2)	(3)	(4)
ComCurr	0.315	0.315	0.311	0.315
	(0.026)***	(0.026)***	(0.026)***	(0.026)***
RTAs	0.387	0.387	0.382	0.387
	(0.010)***	(0.010)***	(0.010)***	(0.010)***
AML	0.035			
	(0.015)**			
CML		0.045		
		(0.074)		
HC			0.081	
			(0.013)***	
NYC				0.001
				(0.012)
Year FE	No	No	No	No
Country*year FE	Yes	Yes	Yes	Yes
Country-pair FE	Yes	Yes	Yes	Yes
Observations	729,932	729,932	729,932	729,932

Structural Gravity

- Structural gravity is the new "Gold Standard" in gravity models

$$X_{ij} = T_{ij} \frac{Y_i E_j}{\Pi_i P_j}$$

  - Y_i is the total value of production in i: $Y_i = X_{ii} + \sum_{j \neq i} X_{ij}$
  - E_j is the expenditure in country j: $E_j = X_{jj} + \sum_{j \neq i} X_{ij}$
  - Π_i and P_j are structural outward and inward multilateral resistance terms (Anderson & van Wincoop, 2003).
- Structural gravity forces account for 95% of variation in product/importer/time and product/exporter/time fixed effects estimated from empirical gravity equations (Anderson & Yotov, 2012)

Recommendations for Estimating Structural Gravity

Yotov et al.,(2016)

- **Recommendation 1:** *Use Panel Data*.
  - Estimation efficiency and pair-fixed-effects methods for endogeneity
- **Recommendation 2**: *Allow for Adjustment in Trade Flows (or not!: Egger et al., 2021)*
  - adjustment in bilateral trade flows in response to trade policy
- **Recommendation 3**: *Include Intra-national Trade Flows.*
  - consistency with gravity theory & identification of the effects of bilateral trade policies
  - Identification of the effects of country-specific trade policies
    - The effects on international trade are measured relative to the effects on intra-national trade
- **Recommendation 4:** *Use Directional Time-varying Fixed Effects*
  - importer-time and exporter-time fixed effects)
- **Recommendation 5**: *Employ Country-Pair Fixed Effects*
  - Endogeneity and all time-invariant bilateral trade costs)
- **Recommendation 6:** Estimate Gravity with PPML
  - Heteroskedasticity, zero trade flows and ensures that the gravity fixed

15+1 Reasons Why Gravity Should Be Estimated with Domestic Trade (Yotov, 2021)

- The use of domestic trade flows in gravity estimations is:

1. consistent with trade theory of the intensive margin of trade,
2. available
    1. and it does not matter much which to use! (Campos et al., 2021),
3. consistent with trade theory of the extensive margin of trade.
4. The use of domestic trade flows allows:
    1. for estimation of the effects of international borders and home biases,
5. for estimation of heterogeneous domestic and regional trade costs,
6. for a systematic analysis of the determinants of domestic trade costs,
7. for country-specific asymmetries in the vector of international trade costs,
8. for identification of the trade-diversion effects of bilateral trade policies,
9. for identification of the effects of non-discriminatory trade policies on bilateral trade flows,
10. for identification of the effects of country-specific characteristics on bilateral trade flows,
11. for identification of the country-specific effects of trade policies,
12. to a solution to "The Distance Puzzle of International Trade",
13. for solving "The Missing Globalization Puzzle",
14. for solving the puzzle that "Larger Countries Should Be Richer than Smaller Countries",
15. for solving the puzzle of "The Missing WTO Effects".

Identifying country-specific effects in structural gravity

Heid et al (2020) & Beverelli et al (2018)

#	i	j	η_1	η_2	μ_1	μ_2	μ_3	$BRDR_{ij}$	$IQ_j \times BRDR_{ij}$
1	A	B	1	0	0	1	0	1	IQ_B
2	A	C	1	0	0	0	1	1	IQ_C
3	B	A	0	1	1	0	0	1	IQ_A
4	B	C	0	1	0	0	1	1	IQ_C
5	C	A	0	0	1	0	0	1	IQ_A
6	C	B	0	0	0	1	0	1	IQ_B
7	A	A	1	0	1	0	0	0	0
8	B	B	0	1	0	1	0	0	0
9	C	C	0	0	0	0	1	0	0

- BRDR is a dummy that identifies international trade
- $\texttt{euro_host}_{jt} \times \texttt{BRDR}_{ijt}$ is not collinear with MRT and can be used to identify the effect of the euro on host countries
  - More specifically the effect of the euro on trade relative to domestic trade
  - However not on home and host countries simultaneously
- Yotov (2021): "The Variation of Gravity within Countries (or 15 Reasons Why Gravity Should Be Estimated with Domestic Trade Flows)"

Empirics

- We use the the Pseudo-Poisson Maximum likelihood (PPML) estimator proposed by Silva and Tenreyro (2006, RES) using Correira's et al. (2019) procedure and Beverelli et al (2018) insights:

Bilateral effects

$$X_{ijt} = \exp\left(\begin{array}{c}\left(\begin{array}{c} BothEMU + OneEMU + \\ nonEMUCU + EU + nonEURTA + \end{array}\right)_{ijt} \times BRDR_{ij} \\ EUtrend_{ijt} + EUtrend_{ijt}^2 \\ + \lambda_{it} + \lambda_{jt} + \chi_{ijt} + \chi_{ij}\end{array}\right) \times e_{ijt}$$

Empirics: General Equilibrium effects

GEPPML: Anderson et al. (2018)

- GEPPML uses a useful property of PPML (Fally 2105) to recover consumer and producer prices from MRT
  - PPML translate the initial response of factory-gate prices into changes in the gravity fixed effects
  - Endogenizes the value of output to estimate a structural GE gravity counterfactuals
  - GEMPPL needs internal trade data (for total output and expenditure)
- The GEPPML is a procedure that consists of 3 steps with 2 stages in each one of them.
  - The first step delivers the "baseline" estimates and the "Baseline" GE indexes
  - The second step of the GEPPML procedure delivers the "conditional" gravity estimates and "Conditional" GE indexes.
  - third step of the GEPPML procedure delivers (also in two stages) the "full en-dowment" gravity estimates and "Full endowment" GE indexes
    - Changes in output and expenditure.

GE Counterfactuals

- CFL1: The cost of the non-EMU
  - removing the variables BothEMU and OneEMU
- CLF 2: Core Multiverse
  - Only Germany, Austria, Belgium, Luxemburg, Finland, France and the Netherlands joined the Euro
- CFL 3: Trade creation effects
  - removing the variables OneEMU

Data

- This paper uses a dataset that updates Zylkin's manufacturing data to the period 1986-2006
  - International and intra-national trade flows data
  - Aggregate manufacturing
  - 69 countries and 41 years.
- The data include consistently constructed international and intra-national trade flows data on aggregate manufacturing trade for 69 countries over the period 1986-2006
  - Data on bilateral trade flows over the period 2006-2016 was gathered from the Direction of Trade (DoT) dataset of the IMF and adjusted to match manufacturing data.
  - Domestic sales have been worked out as the difference between total production and total exports (apparent consumption) of manufacturing products.

	(1) Consecutive years	(2) 2-year intervals	(3) 3-year intervals	(4) 5-year intervals	(5) Consecutive years
Both in EMU	0.207	0.206	0.195	0.238	
	(0.045)***	(0.045)***	(0.047)***	(0.047)***	
One in EMU	0.408	0.411	0.406	0.457	
	(0.032)***	(0.032)***	(0.034)***	(0.033)***	
Both in EMU 1999-07					0.152
					(0.038)***
Both in EMU 2008-16					0.39
					(0.063)***
One in EMU 1999-07					0.3
					(0.025)***
One in EMU 2008-16					0.528
					(0.041)***
All non-EMU CUs	0.168	0.172	0.231	0.045	0.155
	-0.108	-0.107	(0.094)**	-0.115	-0.113
EU	0.721	0.685	0.749	0.817	0.679
	(0.104)***	(0.103)***	(0.106)***	(0.102)***	(0.103)***
All non EU RTAs	0.451	0.442	0.45	0.473	0.447
	(0.069)***	(0.069)***	(0.072)***	(0.073)***	(0.069)***
EU trend	0.001	0.002	0.008	0.003	0.015
	-0.007	-0.007	-0.007	-0.006	(0.006)**
EU trend sq	0	0	0	0	0
	(0.000)**	(0.000)**	0	(0.000)**	0
Observations	147487	76042	52234	33198	147487
HomeYear FE	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses, clustered by country pair

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

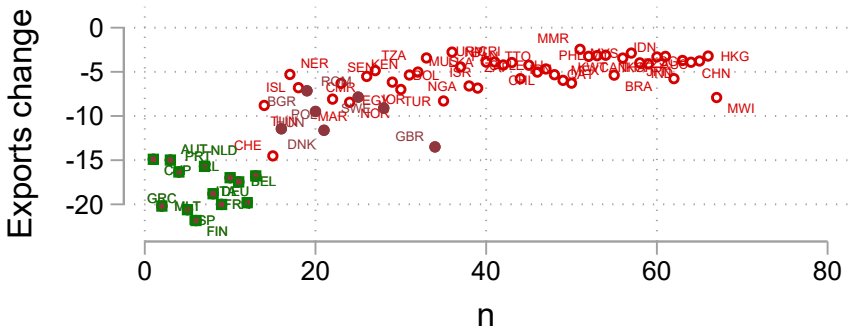
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	consecutive years		2-year intervals		3-year intervals		5-year intervals	
	Both in EMU	One in EMU	Both in EMU	One in EMU	Both in EMU	One in EMU	Both in EMU	One in EMU
Auatria	0.187	0.481	0.192	0.486	0.216	0.494	0.288	0.596
	(0.051)***	(0.081)***	(0.052)***	(0.083)***	(0.051)***	(0.085)***	(0.051)***	(0.085)***
Belgium	0.358	0.603	0.356	0.609	0.264	0.501	0.292	0.581
	(0.055)***	(0.051)***	(0.055)***	(0.052)***	(0.059)***	(0.056)***	(0.059)***	(0.055)***
Finland	-0.081	-0.009	-0.087	-0.005	-0.085	-0.021	-0.026	0.017
	-0.055	-0.083	-0.058	-0.083	-0.062	-0.082	-0.06	-0.082
France	0.171	0.338	0.175	0.348	0.15	0.333	0.208	0.397
	(0.055)***	(0.050)***	(0.055)***	(0.051)***	(0.055)***	(0.056)***	(0.056)***	(0.046)***
Germany	0.198	0.443	0.193	0.443	0.195	0.448	0.231	0.493
	(0.052)***	(0.055)***	(0.052)***	(0.055)***	(0.055)***	(0.057)***	(0.053)***	(0.057)***
Greece	-0.123	0.075	-0.102	0.075	-0.132	0.135	-0.081	0.096
	-0.098	-0.072	-0.1	-0.073	-0.1	-0.088	-0.109	-0.097
Ireland	0.348	0.371	0.304	0.343	0.226	0.288	0.367	0.403
	(0.162)**	(0.171)**	(0.166)*	(0.171)**	-0.147	(0.172)*	(0.147)**	(0.191)**
Italy	-0.017	0.172	-0.012	0.181	-0.004	0.184	0.029	0.212
	-0.054	(0.056)***	-0.054	(0.057)***	-0.055	(0.057)***	-0.055	(0.057)***
Netherlands	0.375	0.668	0.367	0.662	0.467	0.776	0.413	0.751
	(0.049)***	(0.071)***	(0.049)***	(0.072)***	(0.051)***	(0.074)***	(0.051)***	(0.077)***
Portugal	0.245	0.116	0.256	0.152	0.21	0.111	0.354	0.264
	(0.100)**	-0.094	(0.101)**	(0.088)*	(0.102)**	-0.092	(0.105)***	(0.090)***
Spain	0.384	0.515	0.378	0.507	0.373	0.509	0.454	0.583
	(0.055)***	(0.065)***	(0.056)***	(0.065)***	(0.056)***	(0.067)***	(0.059)***	(0.068)***
Malta	0.296	0.444	0.18	0.402	0.222	0.328	0.301	0.426
	-0.342	(0.208)**	-0.274	(0.179)**	-0.345	-0.212	-0.313	(0.191)**
Cyprus	1.121	0.521	1.265	0.597	0.95	0.446	1.331	0.581
	(0.150)***	(0.102)***	(0.165)***	(0.113)***	(0.162)***	(0.116)***	(0.203)***	(0.128)***
Observations	147,487		76,042		52,234		33,198	

Robust standard errors in parentheses, clustered by country pair

	Conditional	Full Endowment General Equilibrium						Conditional	Full Endowment General Equilibrium					
country	% exports	%Δ exports	%Δ real GDP	%Δ IMRs	%Δ OMRs	%Δ price		country	% exports	%Δ exports	%Δ real GDP	%Δ IMRs	%Δ OMRs	%Δ price
CYP	-12.63	-14.90	-6.42	3.38	3.94	-3.26		TUR	-7.86	-8.30	-0.25	0.03	0.26	-0.22
MLT	-19.27	-20.20	-5.58	3.92	2.24	-1.88		NPL	-2.49	-2.77	-0.24	-0.02	0.31	-0.27
AUT	-13.64	-14.98	-5.47	3.01	3.15	-2.62		PAN	-4.19	-4.45	-0.24	0.09	0.17	-0.14
PRT	-15.09	-16.33	-5.27	2.98	2.92	-2.44		NGA	-6.23	-6.60	-0.23	0.03	0.23	-0.20
GRC	-19.60	-20.61	-4.99	3.11	2.44	-2.04		ISR	-6.45	-6.84	-0.21	0.01	0.23	-0.20
FIN	-20.99	-21.83	-4.09	2.34	2.21	-1.85		LKA	-3.61	-3.90	-0.20	-0.02	0.26	-0.22
NLD	-14.67	-15.70	-4.04	1.91	2.63	-2.20		URY	-3.61	-3.88	-0.19	0.02	0.20	-0.17
FRA	-17.98	-18.80	-3.65	2.00	2.04	-1.72		ECU	-3.95	-4.22	-0.18	0.03	0.18	-0.16
ESP	-19.27	-20.01	-3.27	1.68	1.95	-1.64		CRI	-3.69	-3.95	-0.17	-0.00	0.21	-0.18
IRL	-15.72	-16.99	-3.14	0.49	3.20	-2.67		ZAF	-5.42	-5.78	-0.17	-0.02	0.23	-0.19
BEL	-16.61	-17.45	-3.05	1.40	2.01	-1.69		COL	-3.97	-4.24	-0.16	0.03	0.16	-0.14
ITA	-19.07	-19.81	-2.67	1.00	2.02	-1.70		TTO	-4.71	-5.03	-0.15	-0.03	0.22	-0.18
DEU	-15.93	-16.78	-2.16	0.08	2.48	-2.08		CHL	-4.37	-4.67	-0.15	-0.00	0.17	-0.15
TUN	-8.36	-8.81	-0.80	0.28	0.60	-0.52		QAT	-4.96	-5.32	-0.14	-0.11	0.29	-0.25
CHE	-13.85	-14.52	-0.71	-0.05	0.90	-0.77		IRN	-5.58	-5.96	-0.14	-0.04	0.21	-0.18
DNK	-10.90	-11.45	-0.68	0.12	0.66	-0.56		KWT	-5.89	-6.28	-0.13	0.01	0.15	-0.13
NER	-4.91	-5.30	-0.64	0.21	0.50	-0.43		MMR	-2.20	-2.45	-0.13	-0.08	0.25	-0.21
ISL	-6.42	-6.80	-0.60	0.20	0.47	-0.40		CAN	-3.03	-3.24	-0.12	0.02	0.11	-0.10
BGR	-6.75	-7.14	-0.55	0.16	0.46	-0.39		PHL	-2.90	-3.17	-0.10	-0.08	0.22	-0.19
HUN	-9.02	-9.48	-0.52	0.10	0.49	-0.42		MEX	-2.90	-3.12	-0.10	0.01	0.10	-0.09
POL	-11.08	-11.61	-0.51	0.07	0.52	-0.44		BRA	-5.01	-5.37	-0.08	-0.04	0.15	-0.13
MAR	-7.65	-8.09	-0.49	0.01	0.57	-0.49		IDN	-3.16	-3.44	-0.08	-0.09	0.20	-0.17
SEN	-5.98	-6.30	-0.49	0.20	0.34	-0.29		MYS	-2.62	-2.88	-0.08	-0.09	0.20	-0.17
NOR	-8.01	-8.45	-0.48	0.05	0.50	-0.43		IND	-3.66	-3.98	-0.08	-0.10	0.21	-0.18
ROM	-7.45	-7.86	-0.46	0.10	0.42	-0.36		AUS	-3.80	-4.11	-0.07	-0.05	0.14	-0.12
CMR	-5.17	-5.52	-0.45	0.10	0.41	-0.35		THA	-3.02	-3.31	-0.06	-0.11	0.20	-0.17
TZA	-4.53	-4.86	-0.45	0.12	0.39	-0.33		KOR	-2.94	-3.25	-0.04	-0.16	0.23	-0.19
SWE	-8.65	-9.10	-0.38	0.06	0.38	-0.33		USA	-5.35	-5.77	-0.04	0.00	0.04	-0.04
JOR	-5.82	-6.17	-0.36	0.10	0.31	-0.26		JPN	-3.38	-3.71	-0.03	-0.15	0.21	-0.18
EGY	-6.62	-7.00	-0.32	0.07	0.30	-0.26		CHN	-3.56	-3.92	-0.02	-0.16	0.20	-0.17
KEN	-5.04	-5.36	-0.30	0.06	0.28	-0.24		SGP	-3.42	-3.77	-0.01	-0.04	0.07	-0.06
MUS	-4.72	-5.03	-0.29	0.05	0.28	-0.24		HKG	-2.89	-3.21	-0.01	-0.07	0.09	-0.08
BOL	-3.17	-3.43	-0.28	0.06	0.26	-0.22		MWI	-4.19	-7.91	0.61	-0.41	-0.23	0.20
GBR	-12.88	-13.50	-0.25	0.16	0.10	-0.09								

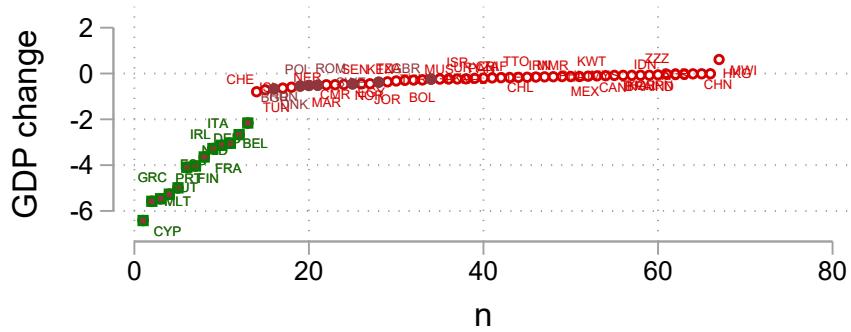
Counterfactual CF1: NO EURO

(a) Exports Change



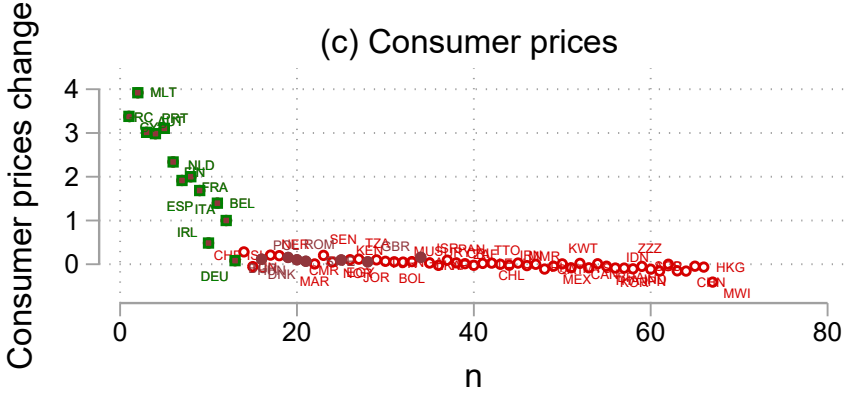
World Exports Change -8.37%
ROW Exports Change -5.23%
EU-non-EMU Exports Change -10.04%
EMU Exports Change -18.06%

(b) GDP Change



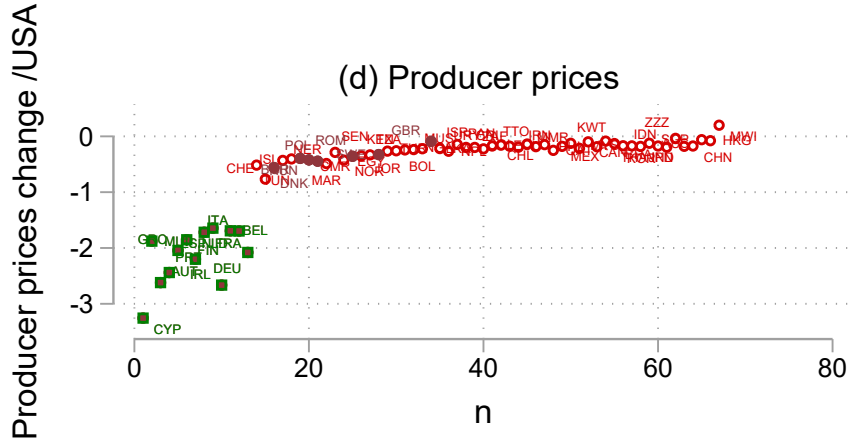
World GDP Change -1.02%
ROW GDP Change -0.21%
EU-non-EMU GDP Change -0.48%
EMU GDP Change -4.15%

(c) Consumer prices



World Consumer prices Change 0.41%
ROW Consumer prices Change -0.00%
EU-non-EMU Consumer prices Change 0.11%
EMU Consumer prices Change 2.09%

(d) Producer prices

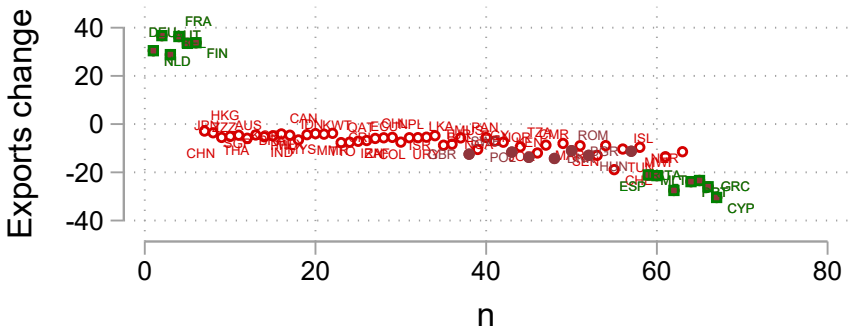


World Producer prices Change -0.61%
ROW Producer prices Change -0.22%
EU-non-EMU Producer prices Change -0.37%
EMU Producer prices Change -2.14%

	Conditional	Full Endowment General Equilibrium						Conditional	Full Endowment General Equilibrium					
country	% exports	%Δ exports	%Δ real GDP	%Δ IMRs	%Δ OMRs	%Δ price		country	% exports	%Δ exports	%Δ real GDP	%Δ IMRs	%Δ OMRs	%Δ price
NLD	34.22	30.46	-2.41	-2.99	6.60	-5.33		ISR	-8.46	-8.77	0.27	-0.07	-0.23	0.20
AUT	41.48	36.72	-2.30	-2.92	6.37	-5.15		NGA	-8.05	-8.31	0.30	-0.10	-0.23	0.20
BEL	31.82	28.82	-1.89	-3.31	6.34	-5.13		PAN	-5.60	-5.74	0.30	-0.17	-0.16	0.14
FRA	39.58	36.33	-1.61	-3.33	6.01	-4.88		GBR	-11.56	-12.47	0.31	-0.30	-0.01	0.01
DEU	36.35	33.50	-0.99	-4.12	6.26	-5.07		TUR	-10.16	-10.52	0.33	-0.10	-0.27	0.23
FIN	37.77	33.77	-0.94	-3.71	5.68	-4.62		BOL	-5.62	-5.55	0.33	-0.11	-0.26	0.22
HKG	-2.70	-2.88	0.02	0.10	-0.14	0.12		MUS	-6.99	-7.06	0.35	-0.11	-0.27	0.23
SGP	-3.36	-3.61	0.02	0.07	-0.11	0.09		KEN	-7.44	-7.51	0.36	-0.12	-0.28	0.24
CHN	-5.19	-5.52	0.02	0.22	-0.28	0.24		SWE	-11.28	-11.62	0.38	-0.13	-0.28	0.24
JPN	-4.84	-5.10	0.04	0.20	-0.28	0.24		EGY	-9.22	-9.41	0.41	-0.15	-0.29	0.25
KOR	-4.46	-4.62	0.05	0.20	-0.29	0.25		POL	-13.30	-13.79	0.43	-0.22	-0.25	0.21
USA	-5.41	-5.86	0.05	0.00	-0.06	0.05		NOR	-11.91	-11.99	0.45	-0.13	-0.37	0.32
THA	-4.37	-4.52	0.08	0.14	-0.25	0.22		JOR	-8.62	-8.71	0.45	-0.20	-0.29	0.25
IND	-5.06	-5.25	0.10	0.12	-0.26	0.22		DNK	-13.96	-14.25	0.50	-0.27	-0.27	0.23
AUS	-4.63	-4.86	0.10	0.05	-0.18	0.15		TZA	-8.18	-8.02	0.52	-0.19	-0.38	0.32
MYS	-3.99	-4.06	0.10	0.10	-0.24	0.20		ROM	-10.93	-11.03	0.52	-0.20	-0.36	0.31
IDN	-4.49	-4.62	0.11	0.10	-0.24	0.20		CMR	-9.11	-8.96	0.53	-0.18	-0.40	0.34
BRA	-6.22	-6.57	0.11	0.04	-0.18	0.15		HUN	-12.87	-12.97	0.57	-0.21	-0.42	0.36
PHL	-4.33	-4.39	0.13	0.09	-0.25	0.22		MAR	-13.15	-12.98	0.57	-0.06	-0.60	0.52
MEX	-3.78	-3.94	0.13	-0.03	-0.11	0.10		SEN	-8.92	-8.92	0.60	-0.33	-0.32	0.27
CAN	-4.02	-4.17	0.15	-0.05	-0.12	0.10		CHE	-18.68	-18.89	0.60	-0.07	-0.62	0.53
MMR	-3.90	-3.83	0.15	0.09	-0.28	0.24		ISL	-10.50	-10.35	0.65	-0.30	-0.40	0.34
QAT	-7.48	-7.68	0.17	0.11	-0.32	0.28		BGR	-11.37	-11.27	0.66	-0.27	-0.45	0.39
IRN	-7.19	-7.51	0.17	0.02	-0.23	0.20		NER	-9.99	-9.62	0.73	-0.31	-0.49	0.42
KWT	-6.76	-7.13	0.18	-0.05	-0.15	0.13		ITA	-20.58	-21.09	0.74	0.02	-0.88	0.76
TTO	-6.60	-6.81	0.19	0.01	-0.23	0.20		ESP	-21.02	-21.37	0.95	-0.17	-0.90	0.78
CHL	-5.75	-5.96	0.19	-0.03	-0.18	0.16		TUN	-13.77	-13.54	0.96	-0.45	-0.58	0.50
CRI	-5.59	-5.68	0.21	-0.03	-0.21	0.18		IRL	-27.75	-27.51	1.18	0.40	-1.82	1.58
COL	-5.34	-5.51	0.21	-0.07	-0.16	0.14		MWI	-8.79	-11.46	1.75	-0.78	-1.10	0.95
ZAF	-7.22	-7.48	0.22	-0.01	-0.24	0.21		PRT	-24.05	-23.87	1.92	-0.76	-1.32	1.15
ECU	-5.51	-5.65	0.23	-0.07	-0.19	0.16		MLT	-23.44	-23.40	2.27	-1.38	-0.99	0.86
LKA	-5.61	-5.63	0.23	0.00	-0.27	0.24		GRC	-26.19	-26.00	2.42	-1.24	-1.33	1.15
URY	-5.35	-5.44	0.24	-0.06	-0.21	0.18		CYP	-31.46	-30.44	3.63	-1.51	-2.35	2.06
NPL	-5.00	-4.81	0.27	0.02	-0.33	0.28								

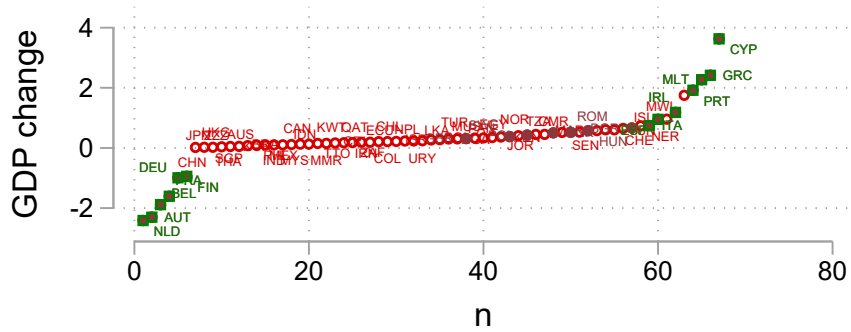
Counterfactual CFL 2: EURO only core

(a) Exports Change



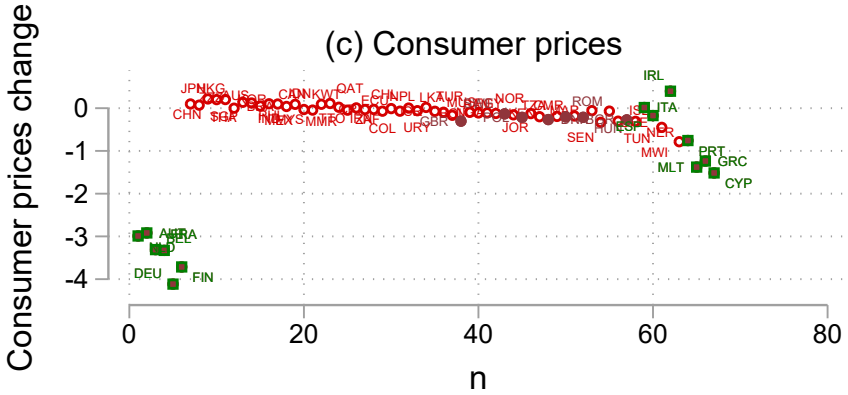
World Exports Change -6.80%
ROW Exports Change -7.19%
EU-non-EMU Exports Change -12.49%
EMU Exports Change -2.14%

(b) GDP Change



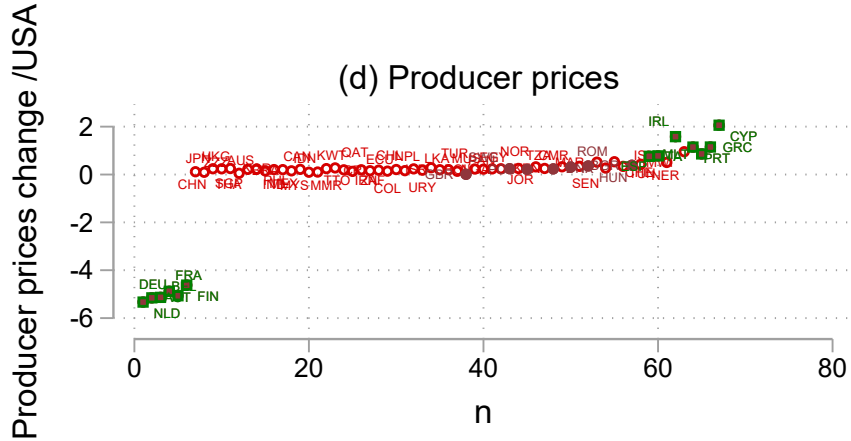
World GDP Change 0.30%
ROW GDP Change 0.30%
EU-non-EMU GDP Change 0.48%
EMU GDP Change 0.21%

(c) Consumer prices



World Consumer prices Change -0.44%
ROW Consumer prices Change -0.06%
EU-non-EMU Consumer prices Change -0.23%
EMU Consumer prices Change -1.94%

(d) Producer prices

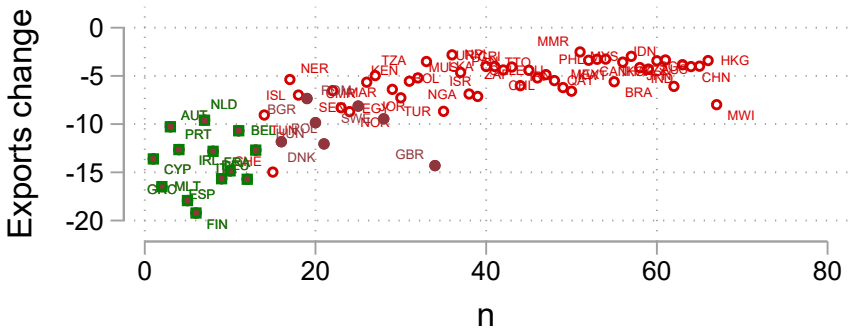


World Producer prices Change -0.14%
ROW Producer prices Change 0.25%
EU-non-EMU Producer prices Change 0.25%
EMU Producer prices Change -1.73%

	Conditional	Full Endowment General Equilibrium						Conditional	Full Endowment General Equilibrium					
country	% exports	%Δ exports	%Δ real GDP	%Δ IMRs	%Δ OMRs	%Δ price		country	% exports	%Δ exports	%Δ real GDP	%Δ IMRs	%Δ OMRs	%Δ price
CYP	-11.58	-13.61	-5.41	2.72	3.42	-2.84		TUR	-8.26	-8.68	-0.29	0.04	0.30	-0.26
MLT	-15.56	-16.48	-4.54	2.98	2.01	-1.69		NPL	-2.51	-2.82	-0.28	-0.03	0.37	-0.31
AUT	-9.00	-10.27	-4.26	2.15	2.64	-2.20		PAN	-4.38	-4.64	-0.28	0.12	0.20	-0.17
PRT	-11.47	-12.65	-4.20	2.21	2.49	-2.08		NGA	-6.53	-6.88	-0.28	0.04	0.27	-0.23
GRC	-16.95	-17.93	-4.17	2.43	2.19	-1.84		ISR	-6.75	-7.13	-0.25	0.02	0.27	-0.23
FIN	-18.40	-19.22	-3.45	1.83	2.00	-1.68		LKA	-3.73	-4.03	-0.24	-0.03	0.31	-0.26
NLD	-8.58	-9.60	-3.09	1.27	2.21	-1.86		URY	-3.75	-4.02	-0.23	0.03	0.24	-0.20
FRA	-11.99	-12.82	-2.83	1.36	1.79	-1.51		ECU	-4.12	-4.39	-0.22	0.04	0.21	-0.18
ESP	-14.93	-15.67	-2.62	1.20	1.72	-1.45		CRI	-3.82	-4.08	-0.21	0.00	0.24	-0.20
IRL	-13.69	-14.85	-2.59	0.31	2.74	-2.29		ZAF	-5.67	-6.01	-0.20	-0.02	0.27	-0.23
BEL	-9.84	-10.69	-2.32	0.88	1.74	-1.47		COL	-4.15	-4.42	-0.20	0.04	0.19	-0.16
ITA	-14.99	-15.72	-2.15	0.69	1.75	-1.47		TTO	-4.90	-5.21	-0.18	-0.03	0.25	-0.22
DEU	-11.88	-12.70	-1.72	-0.01	2.05	-1.72		CHL	-4.58	-4.87	-0.18	0.00	0.20	-0.17
TUN	-8.57	-9.06	-0.93	0.34	0.70	-0.60		QAT	-5.13	-5.49	-0.17	-0.13	0.35	-0.30
CHE	-14.31	-14.98	-0.82	-0.05	1.03	-0.87		IRN	-5.85	-6.21	-0.16	-0.05	0.25	-0.21
DNK	-11.30	-11.83	-0.77	0.18	0.70	-0.59		KWT	-6.22	-6.59	-0.16	0.01	0.17	-0.15
NER	-4.93	-5.38	-0.75	0.25	0.59	-0.50		MMR	-2.24	-2.52	-0.16	-0.10	0.30	-0.25
ISL	-6.58	-6.99	-0.71	0.24	0.54	-0.46		CAN	-3.17	-3.38	-0.14	0.03	0.13	-0.11
BGR	-6.93	-7.35	-0.65	0.19	0.54	-0.46		PHL	-3.00	-3.28	-0.12	-0.10	0.26	-0.22
HUN	-9.39	-9.85	-0.63	0.14	0.58	-0.49		MEX	-3.05	-3.26	-0.11	0.01	0.12	-0.10
POL	-11.55	-12.06	-0.59	0.12	0.55	-0.47		BRA	-5.26	-5.60	-0.10	-0.05	0.18	-0.15
SEN	-6.19	-6.53	-0.58	0.25	0.39	-0.33		IDN	-3.28	-3.57	-0.10	-0.10	0.23	-0.20
MAR	-7.82	-8.30	-0.58	0.00	0.67	-0.57		MYS	-2.71	-2.97	-0.10	-0.11	0.24	-0.20
NOR	-8.26	-8.71	-0.56	0.07	0.57	-0.49		IND	-3.82	-4.14	-0.09	-0.12	0.25	-0.21
ROM	-7.72	-8.14	-0.54	0.13	0.48	-0.41		AUS	-3.99	-4.30	-0.09	-0.06	0.17	-0.15
CMR	-5.28	-5.66	-0.53	0.13	0.48	-0.41		THA	-3.13	-3.43	-0.07	-0.13	0.24	-0.21
TZA	-4.61	-4.97	-0.53	0.14	0.45	-0.39		KOR	-3.04	-3.35	-0.05	-0.19	0.27	-0.23
SWE	-9.02	-9.45	-0.45	0.08	0.44	-0.37		USA	-5.69	-6.09	-0.04	0.00	0.05	-0.04
JOR	-6.04	-6.40	-0.43	0.13	0.36	-0.31		JPN	-3.51	-3.84	-0.03	-0.18	0.25	-0.21
EGY	-6.90	-7.27	-0.39	0.09	0.35	-0.30		CHN	-3.70	-4.03	-0.02	-0.19	0.24	-0.21
KEN	-5.23	-5.55	-0.35	0.07	0.33	-0.28		SGP	-3.65	-3.99	-0.02	-0.06	0.09	-0.07
MUS	-4.89	-5.21	-0.34	0.06	0.32	-0.28		HKG	-3.09	-3.41	-0.01	-0.08	0.11	-0.10
BOL	-3.23	-3.51	-0.33	0.08	0.30	-0.26		MWI	-4.19	-7.98	0.52	-0.38	-0.16	0.14
GBR	-13.75	-14.30	-0.29	0.21	0.09	-0.08								

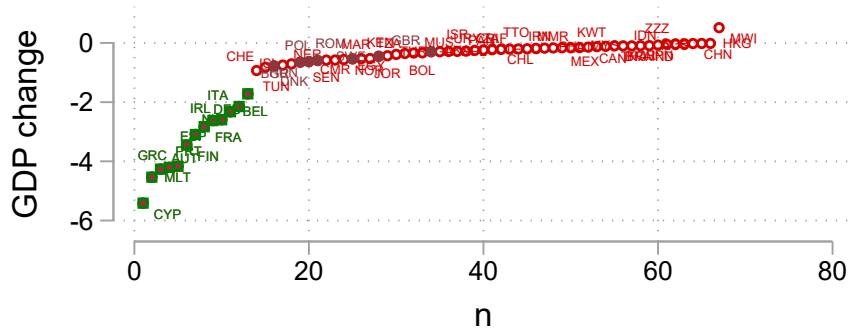
Counterfactual CFL 3: NO EURO ONE

(a) Exports Change



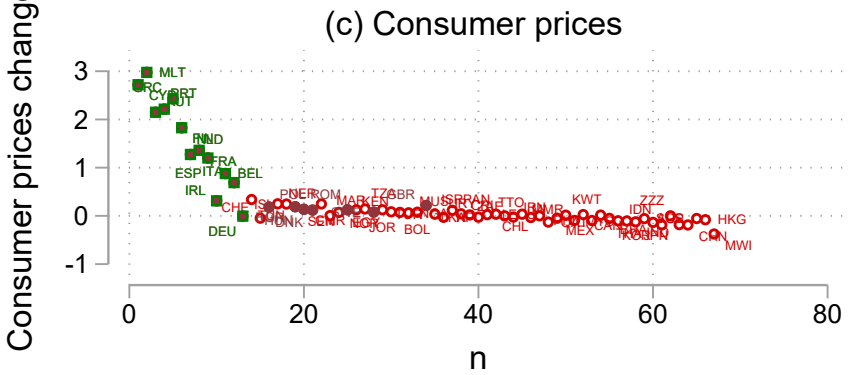
World Exports Change -7.69%
ROW Exports Change -5.41%
EU-non-EMU Exports Change -10.45%
EMU Exports Change -14.06%

(b) GDP Change



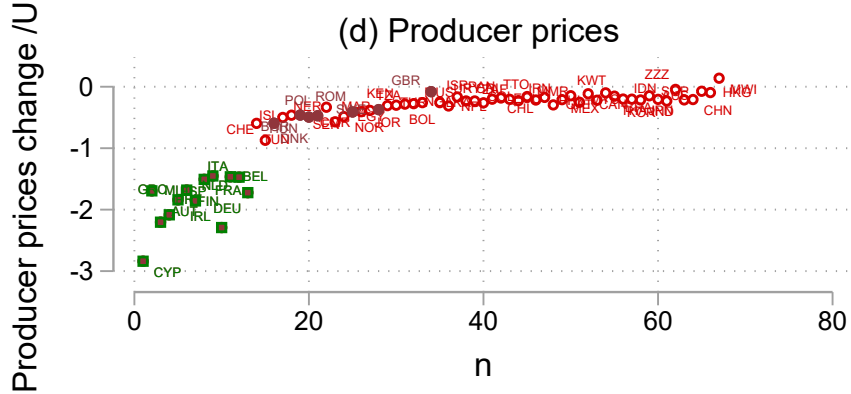
World GDP Change -0.90%
ROW GDP Change -0.26%
EU-non-EMU GDP Change -0.56%
EMU GDP Change -3.34%

(c) Consumer prices



World Consumer prices Change 0.31%
ROW Consumer prices Change 0.00%
EU-non-EMU Consumer prices Change 0.15%
EMU Consumer prices Change 1.54%

(d) Producer prices



World Producer prices Change -0.59%
ROW Producer prices Change -0.26%
EU-non-EMU Producer prices Change -0.41%
EMU Producer prices Change -1.86%

Take-away

1. This paper examines the Euro effect on trade with structural gravity and trade-induced welfare effects within the estimable general equilibrium framework of GEPPML.
2. The Structural gravity estimates show that Euro's effect on trade was more intense during the most recent decade, despite the trade collapse of 2009.
3. The GE analysis uncovered several exciting traits regarding welfare analysis and the EMU effect.
4. On the methods front, the results suggested that trade creation/deviation and dynamics are essential for quantifying the trade-induced effects of economic integration on welfare.

Policy

1. Our results have some policy implications. Specifically, this study indicates that the Euro has been successful at promoting economic growth and delivering positive welfare effects on consumers and producers within and outside the Eurozone.
2. The main policy message is that the Euro has been a successful experiment in exports and economic growth for consumers and producers within and outside the Euro area. A better design or phasing in the Euro like the two-speed Euro would have led to higher growth. The critical distributional effects, however, would have triggered political-economy forces to prevent this scenario.
3. Further, trade creation outside the EMU appears to be the primary driver of the GE Euro effects. However, the question whether the Euro is an effective glue for the EMU's economic integration policy merits further research.