Dominant Currency Paradigm

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CREI Lectures, 2018

Lecture I

References

1. "Banking, Trade, and the Making of a Dominant Currency" (2018), Gopinath, Stein

2. "Dominant Currency Paradigm" (2017), Casas, Diez, Gopinath, Gourinchas

3. "Global Trade and the Dollar" (2017), Boz, Gopinath, Plagborg-Møller

4. "The International Price System" (2015), Gopinath

5. "International Prices and Exchange Rates" (2014), Burstein and Gopinath

6. "Currency Choice and Exchange Rate Pass-through" (2010), Gopinath, Itskhoki, Rigobon

Keynesian Open Economy Macro

Nominal Rigidities

Keynesian Open Economy Macro
Nominal Rigidities

1. **First generation:** Fleming (1962), Mundell (1963), Dornbusch (1976), Svenson & van Wijnbergen (1989), Obstfeld & Rogoff (1995), Galí and Monacelli (2005)

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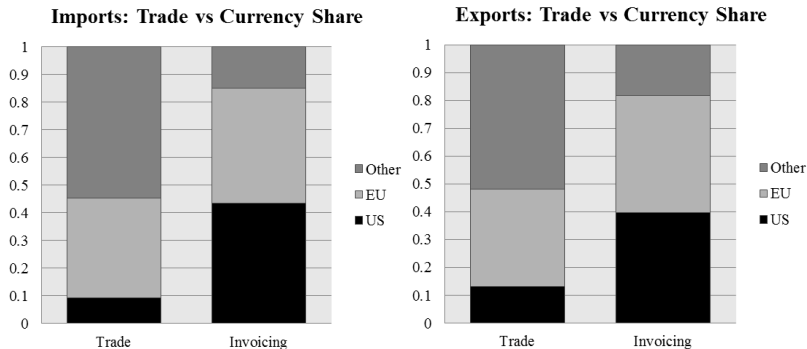
Symmetry, Bilateral ERs important

Road Map

1. Facts: International prices and quantities

2. Keynesian macro redux

3. Endogenous currency choice

Road Map

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Dominance of dollar invoicing in world trade

Gopinath (2015), Jackson Hole Symposium

- Covers 55% of imports, 57% of exports. Averages post 1999.
- Dollar invoicing share: 4.7 (3.1) times US share in world imports (exports).
- Euro invoicing share: 1.2 times for imports and exports.
- McKinnon (2001), Goldberg and Tille (2009), Goldberg (2013), Ito and Chinn (2013), Gopinath (2015)

Empirical Evidence Vs. Assumptions of MFP

1. Countries exports overwhelmingly invoiced in dollars
2. India:
   - 86% imports invoiced in dollars, only 5% imports from U.S.
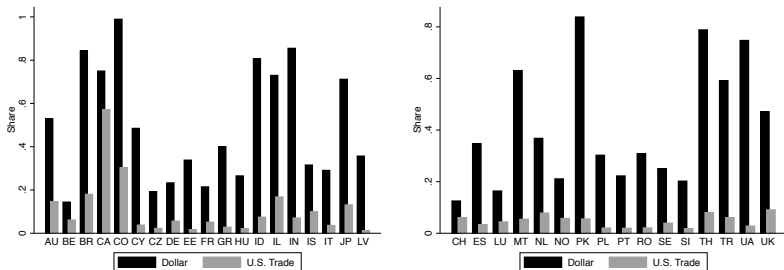   - 86% exports invoiced in dollars, only 15% exports to the U.S.

Figure: Dollar Dominance in World Trade: By Country

Empirical Evidence Vs. Assumptions of MFP

❶ Countries exports overwhelmingly invoiced in dollars

Table 1: Limited Own Currency Use in Trade, except for U.S.

Country	Imports	Exports	Country	Imports	Exports
United States	0.93	0.97	Canada	0.20	0.23
Italy*	0.58	0.61	Poland	0.06	0.04
Germany*	0.55	0.62	Iceland	0.06	0.05
Spain*	0.54	0.58	Thailand	0.04	0.07
France*	0.45	0.50	Israel	0.03	0.00
United Kingdom	0.32	0.51	Turkey	0.03	0.02
Australia	0.31	0.20	South Korea	0.02	0.01
Switzerland	0.31	0.35	Brazil	0.01	0.01
Norway	0.30	0.03	Indonesia	0.01	0.00
Sweden	0.24	0.39	India	0.00	0.00
Japan	0.23	0.39			

Source: Gopinath (2015)

Implications of currency of invoicing under sticky prices

$$p_{ij} = p_{ij}^i + e_{ij} = p_{ij}^\$ + e_{\$j}$$

$$tot_{ij} = p_{ij} - (p_{ji} + e_{ij}) = p_{ij}^\$ - p_{ji}^\$$$

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	$\Delta e_{ij} = 1$		$\Delta e_{\$j} = 1$	
	Δp_{ij}	Δtot_{ij}	Δp_{ij}	Δtot_{ij}
PCP	1	1	0	0
LCP	0	-1	0	0
DCP	0	0	1	0

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Testable Implications

1. The bilateral TOT should be insensitive to bilateral ER.

2. For non-US countries ERPT into import prices (in home currency) should be high and driven by the $ ER as opposed to the bilateral ER.
   a. Countries that rely more heavily on dollar import invoicing should see more of this effect.

3. For non-US countries, import quantities should be driven by the $ ER as opposed to the bilateral ER.

4. When all countries uniformly depreciate relative to the dollar, it should lead to a decline in trade between the rest of the world.

5. For the US, on the contrary, PT into import prices and quantities should be low.

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1. Reset prices: Real rigidities keep prices 'sticky' for longer
   - Strategic complementarities in pricing, imported inputs

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3. Endogeneity of exchange rates
   - ER disconnect puzzle

Components of data set

1. Newly constructed Comtrade bilateral trade indices. Unit value and volume, non-commodities. Bussière et al. (2016); Boz & Cerutti (2017)
2. Country-level import invoicing currency shares. Kamps (2006); Chinn & Ito (2014); Gopinath (2015)
3. Country-level/global macro data: WDI, FRED.

- Annual, 1989–2015.
- 55 countries (31 advanced). Account for 91% of world's goods imports and exports in 2015. ▸ List
- 2,807 dyads (country pairs) in largest specification.
- USD import invoicing share for 38 countries.

Terms of trade and bilateral exchange rates

> Result 1: Bilateral TOT essentially uncorrelated with bilateral ER.

VARIABLES	unweighted		trade-weighted	
	(1) $\Delta tot_{ij,t}$	(2) $\Delta tot_{ij,t}$	(3) $\Delta tot_{ij,t}$	(4) $\Delta tot_{ij,t}$
$\Delta e_{ij,t}$	0.0369***	-0.00938	0.0813***	0.0218
	(0.00863)	(0.0130)	(0.0235)	(0.0317)
ΔER lags	2	2	2	2
PPI	no	yes	no	yes
Time FE	yes	yes	yes	yes
R-squared	0.008	0.011	0.028	0.042
Observations	24,270	19,847	24,270	19,847
Dyads	1,347	1,200	1,347	1,200

Terms of trade and bilateral exchange rates

TERMS OF TRADE AND EXCHANGE RATES: COUNTRY GROUP HETEROGENEITY

VARIABLES	unweighted			trade-weighted		
	(1) E↔E $\Delta tot_{ij,t}$	(2) E↔A $\Delta tot_{ij,t}$	(3) A↔A $\Delta tot_{ij,t}$	(4) E↔E $\Delta tot_{ij,t}$	(5) E↔A $\Delta tot_{ij,t}$	(6) A↔A $\Delta tot_{ij,t}$
$\Delta e_{ij,t}$	0.0189 (0.0173)	0.0480*** (0.0110)	0.0182 (0.0256)	0.0508*** (0.0176)	0.111*** (0.0310)	0.0220 (0.0473)
ΔER lags	2	2	2	2	2	2
PPI	no	no	no	no	no	no
Time FE	yes	yes	yes	yes	yes	yes
R-squared	0.028	0.011	0.008	0.051	0.078	0.025
Observations	3,527	11,857	8,886	3,527	11,857	8,886
Dyads	217	670	460	217	670	460

Table: "E↔A", say, denotes goods flows between Emerging and Advanced economies. The first (resp., last) three columns use unweighted (resp. trade-weighted) regressions. S.e. clustered by dyad. *** p<0.01, ** p<0.05, * p<0.1.

Terms of Trade: Colombia

2005-2014

- Commodity Currency, free float since September 1999
- Currency composition of exports: USD: 98.4%
- Weighted (by income) average imported input share: 38% for manufacturers, 44% for manuf exporters
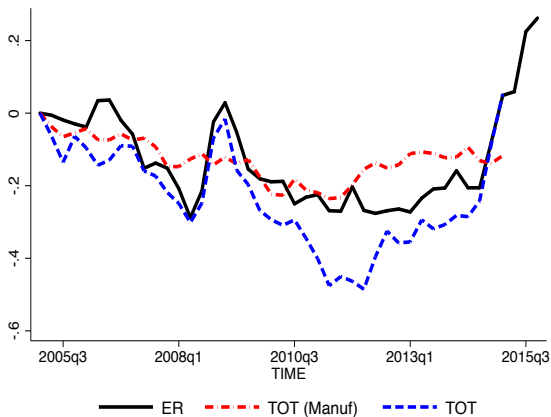
- $\beta_{TOT,ER} = 1.15$, $\beta_{MTOT,ER} = 0.33$

Exchange rate pass-through into prices

$$p_{ij} = \mu_{ij}(p_{ij} - p_j) + mc_{ij}(w_i, e_{ij})$$

$$\Delta p_{ij,t} = \lambda_{ij} + \delta_t + \sum_{k=0}^{2} \beta_k \Delta e_{ij,t-k} + \sum_{k=0}^{2} \beta_k^{\$} \Delta e_{\$j,t-k}$$
$$+ \sum_{k=0}^{2} \eta_k \Delta e_{ij,t-k} \times S_j + \sum_{k=0}^{2} \eta_k^{\$} \Delta e_{\$j,t-k} \times S_j + \theta' X_{i,t} + \varepsilon_{ij,t},$$

- λ_{ij} and δ_t are dyadic and time fixed effects.
- $X_{i,t}$: Δppi of the exporting country i (and importing country) measured in currency i (and two lags).
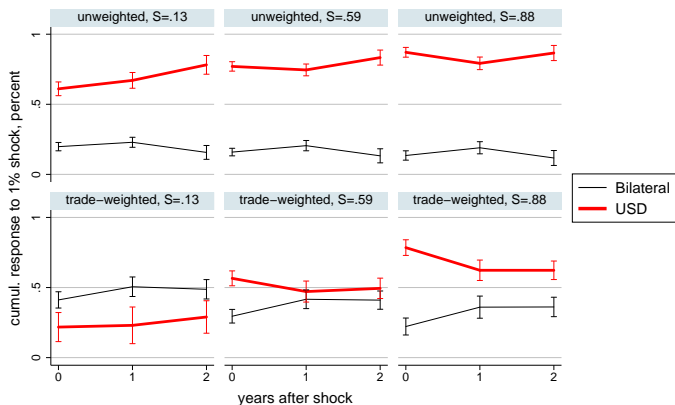- S_j: importing country's dollar invoicing share

Exchange rate pass-through into prices

Result 2: USD dominates bilateral ER in ERPT regressions.
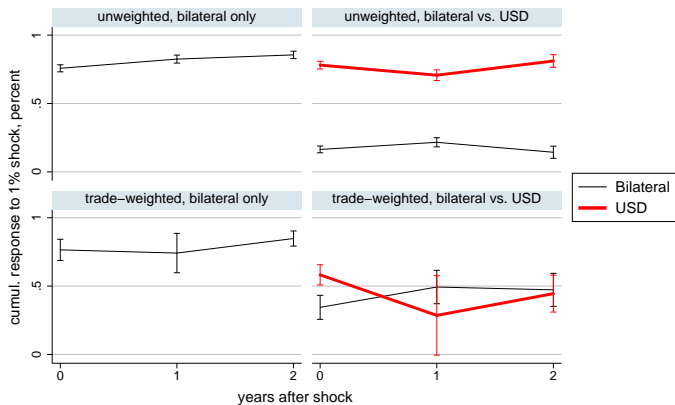
Dollar's importance increasing in dollar invoicing share

Switzerland, Turkey, Argentina

- increasing the dollar invoicing share by 10 percentage points causes the contemporaneous dollar pass-through to increase by 3.5 percentage points.

Exchange rate pass-through into prices: Country group heterogeneity

	unweighted				
	(1)	(2)	(3)	(4)	(5)
	E→E	E→A	A→E	A→A	E→E
	$\Delta p_{ij,t}$	$\Delta p_{ij,t}$	$\Delta p_{ij,t}$	$\Delta p_{ij,t}$	$\Delta p_{ij,t}$
$\Delta e_{ij,t}$	0.0980***	0.0514**	0.265***	0.332***	0.150***
	(0.0329)	(0.0225)	(0.0379)	(0.0195)	(0.0391)
$\Delta e_{\$j,t}$	0.858***	0.766***	0.710***	0.409***	0.820***
	(0.0353)	(0.0364)	(0.0382)	(0.0284)	(0.0487)
R-squared	0.470	0.152	0.530	0.142	0.572
Observations	6,763	10,589	12,318	17,150	6,763
Dyads	435	618	700	894	435

Table: "E→A", say, denotes goods flows from Emerging to Advanced economies. The first (resp., last) four columns use unweighted (resp. trade-weighted) regressions as in specifications (2) and (5) of Table **??**. All
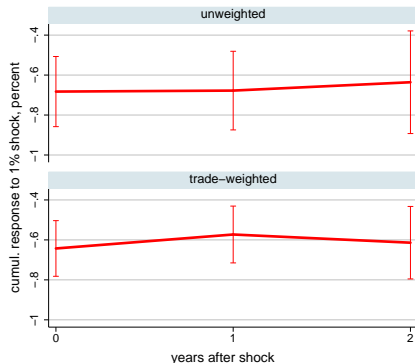
Trade volume elasticity

> **Result 3:** USD dominates bilateral ER in forecasting trade volumes. Large implied effect of USD appreciation on rest-of-world trade.
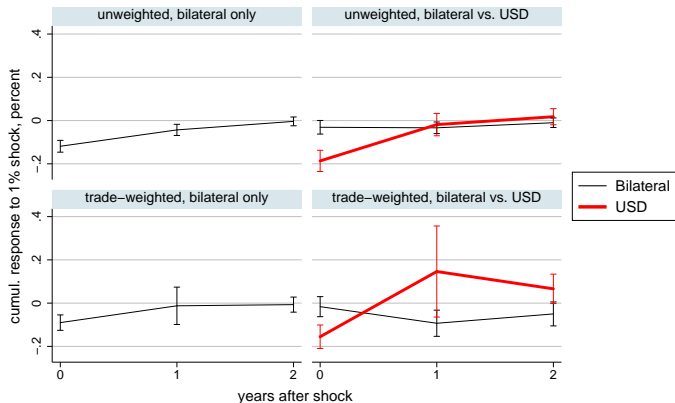
# Effect of dollar appreciation on rest-of-world trade

Result 4: Dollar appreciation predicts decline in ROW trade

Figure: Impulse responses of rest-of-world aggregate trade volume to a 1% U.S. dollar appreciation against all other currencies, holding constant all other exchange rates and the global business cycle (exporter PPI log growth, global real GDP growth, global GDP deflator inflation, growth in the WTI oil price deflated by the global GDP deflator, log VIX, importer GDP growth)

Asymmetry in pass-through

> Result 5: U.S. import PT in price and quantity low

PRICE PASS-THROUGH: FLOWS TO AND FROM U.S.
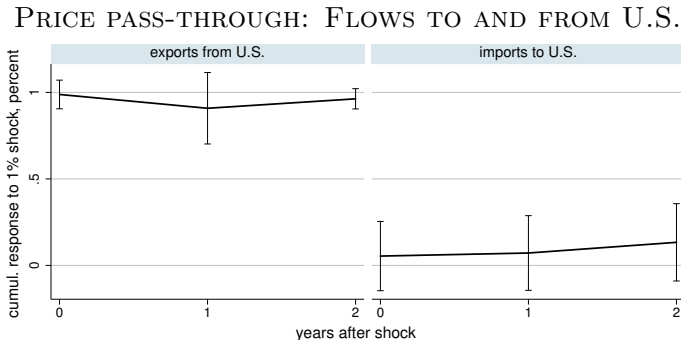
Figure: Impulse response of bilateral price level to bilateral exchange rate $e_{ij,t}$. Left column: U.S. exports, right column: U.S. imports. Error bars: 95% confidence intervals.

Asymmetry in pass-through

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Trade elasticity: U.S. vs. non-U.S. imports

|	unweighted (1) $\Delta y_{ij,t}$	trade-weighted (2) $\Delta y_{ij,t}$
$\Delta e_{ij,t}$	-0.121***	-0.107***
	(0.0141)	(0.0194)
$\Delta e_{ij,t} \times$ ImpUS	0.124***	0.117***
	(0.0329)	(0.0318)
R-squared	0.069	0.180
Observations	52,272	52,272
Dyads	2,807	2,807

Effect of dollar appreciation on CPI/PPI, 2002–2015

> Result: USD ER strongly correlates with country-level CPI/PPI.

DOLLAR PASS-THROUGH INTO CPI AND PPI, 2002–2015

| VARIABLES	(1) $\Delta cpi_{j,t}$	(2) $\Delta cpi_{j,t}$	(3) $\Delta ppi_{j,t}$	(4) $\Delta ppi_{j,t}$
$\Delta e_{\$j,t}$	0.106*** [0.04, 0.18]	0.0221 [-0.05, 0.09]	0.284*** [0.14, 0.43]	0.182*** [0.05, 0.32]
$\Delta e_{\$j,t} \times S_j$		0.181** [0.04, 0.33]		0.237* [-0.03, 0.51]
ΔER lags	2	2	2	2
Time FE	yes	yes	yes	yes
R-squared	0.283	0.453	0.532	0.675
Observations	766	544	697	525

Dollar versus Euro

PRICE PASS-THROUGH FROM DOLLAR AND EURO EXCHANGE RATES
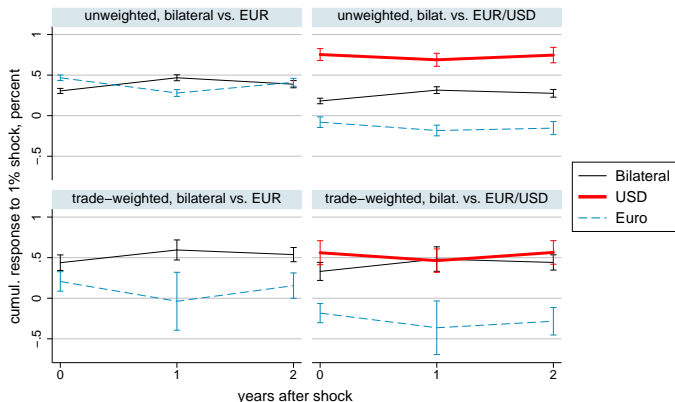
Figure: Impulse responses of bilateral price level to bilateral $e_{ij,t}$, USD $e_{\$j,t}$, and euro $e_{\in j,t}$ exchange rates. Top row: unweighted regression, bottom row: trade-weighted. Left column: specifications with only bilateral and euro ER, right column: specifications adding USD. Error bars: 95% confidence intervals, clustering by dyad.

Auer, Burstein, Lein (2017)

Figure 2: *CHF/EUR and border prices*
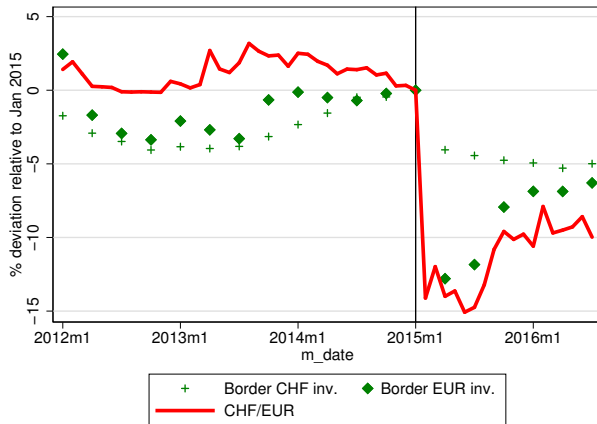
Notes: The red solid sline shows the log-difference in the exchange rate between Jan 14, 2014 and a given month. The crosses and diamonds show the log difference in border prices of EUR and CHF invoiced products between the period in the horizontal axis and January 2015 (Jan 2015=0). Source: SNB (exchange rate), and own calculations based on SFSO data.

Auer, Burstein, Lein (2017)

Figure 6: *Change in import market share by invoicing bin*

Switching and Invoicing
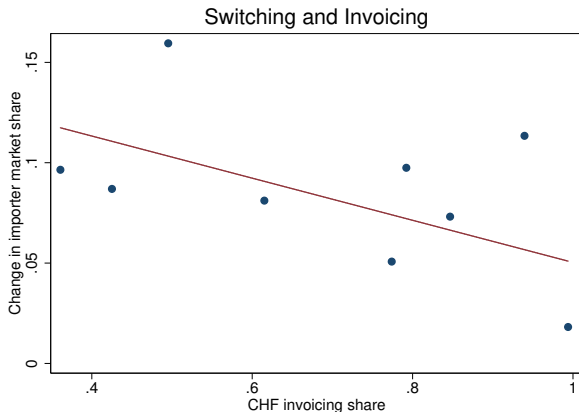
Notes: Bin scatter plot of the change in importer market share between January 2013 - May 2014 and January 2015 - May 2016 by invoicing share of the product group. 10 bins.