

Dominant Currency Paradigm

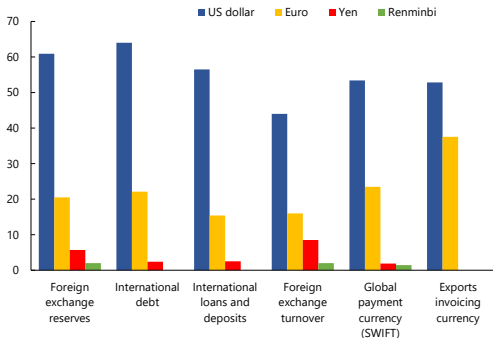
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John Kenneth Galbraith Lecture
American Agricultural and Applied Economics Association

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Motivation: Dominant Currencies

- 180 currencies, but only very few used in trade, finance, reserves



- Nevertheless, literature focused on symmetric frameworks
- Access to new data spurred dominant currency literature

Conventional Pricing Paradigms

① First-generation paradigm: Producer currency pricing (PCP)

- ER Depreciations: increase price of imports relative to domestic goods (\downarrow imports) & reduce price of domestic goods in international markets (\uparrow exports)
- Mundell (1963), Fleming (1962), Friedman (1953), Dornbusch (1976), Svensson and van Wijnbergen (1989) and Obstfeld and Rogoff (1995), Galí and Monacelli (2005)
 - motivated by sticky wages:

② Second-generation paradigm: Local currency pricing (LCP)

- ER Depreciations: no change of price of imports relative to domestic goods (\leftrightarrow imports) & no change price of domestic goods in international markets (\leftrightarrow exports)
- Betts and Devereux (2000), Devereux and Engel (2003), Bacchetta and van Wincoop (2000), CKM (2002)

Dominant Currency Paradigm (DCP)

- Asymmetry in the role of currencies
- has real implications:
 - ① ER Depreciations: increase price of imports relative to domestic goods (\downarrow imports) & no change in price of domestic goods in international markets (\leftrightarrow exports)
 - ② 'Invoice currency weighted ER' trumps 'Trade weighted ER'
 - ③ decline in world-wide trade due to the US dollar appreciation
 - ④ policy implications: e.g. border adjustment tax and trade wars
- Goldberg and Tille (2008), Gopinath et al (2010), Gopinath et al.(2020); Boz et.al. (2020), Amiti et al. (2020); Mukhin (2020)

Roadmap

- ① Evidence and positive implications of DCP
- ② Asymmetries in shock transmission
- ③ Optimal monetary and exchange rate policy under DCP
- ④ Endogenous currency choice and global DCP equilibrium

Currency Use in Exports

	USD	EUR	Home
Advanced economies	42.8	45.3	5.7
— US	95.8	1.3	—
— Euro Area	17.4	77.6	—
— excl. US and Euro Area	55.0	17.6	21.1
— Japan	50.1	7.1	38.3
Emerging markets	68.1	23.8	5.0
— Asia	85.4	4.6	3.3
— Latin America	95.9	3.0	0.6
— North Africa	60.0	35.1	6.2

Source: Boz et al. (2020) and Eurostat, averages over 2003-2019.

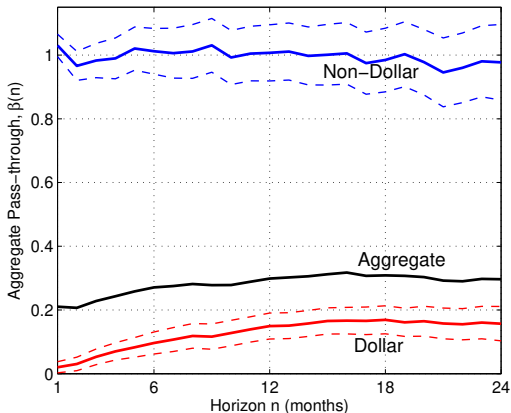
- US dollar as the global dominant currency and Euro as the regional dominant currency

Implications of currency of invoicing under sticky prices

$$\Delta p_{ij} = \begin{cases} 1 \cdot \Delta e_{ij} + 0 \cdot \Delta e_{vj} & \text{if IC}=i \\ 0 \cdot \Delta e_{ij} + 0 \cdot \Delta e_{vj} & \text{if IC}=j \\ 0 \cdot \Delta e_{ij} + 1 \cdot \Delta e_{vj} & \text{if IC}=v \end{cases}$$

- domestic price moves one-to-one with the *bilateral* ER if the price is sticky in the producer's currency;
- is disconnected from any ER if price is sticky in local currency;
- moves one-to-one with the *vehicle* currency exchange rate if prices are sticky in the vehicle currency

Currency Use and ERPT



Source: Gopinath, Itskhoki and Rigobon (2010), US imports.

- Many recent studies confirm these patterns of pass-through by currency of invoicing for various countries

Currency Use and ERPT: Global Evidence

	(1) $\Delta p_{ij,t}$	(2) $\Delta p_{ij,t}$	(3) $\Delta p_{ij,t}$
$\Delta e_{ij,t}$	0.757*** (0.0132)	0.164*** (0.0126)	0.209*** (0.0169)
$\Delta e_{ij,t} \times S_j$			-0.0841*** (0.0240)
$\Delta e_{\$j,t}$		0.781*** (0.0143)	0.565*** (0.0283)
$\Delta e_{\$j,t} \times S_j$			0.348*** (0.0326)
R-squared	0.356	0.398	0.515
Observations	46,820	46,820	34,513

Notes: $p_{ij,t}$: domestic currency price of good imported from i to j , $e_{ij,t}$: bilateral ER, $e_{\$j,t}$: ER with respect to the dollar, S_j : dollar invoicing share.

- Including dollar ER reduces the relevance of bilateral ER.

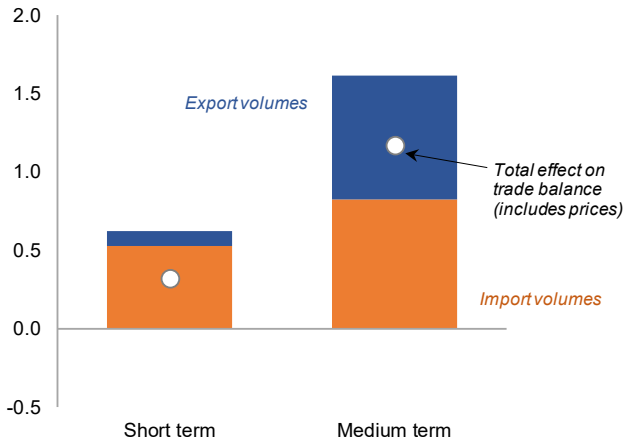
Trade Elasticity & Expenditure Switching

	(1) $\Delta y_{ij,t}$	(2) $\Delta y_{ij,t}$	(3) $\Delta y_{ij,t}$
$\Delta e_{ij,t}$	-0.119*** (0.0139)	-0.0310* (0.0160)	-0.0765* (0.0403)
$\Delta e_{ij,t} \times S_j$			0.118* (0.0684)
$\Delta e_{\$j,t}$		-0.186*** (0.0250)	-0.140** (0.0600)
$\Delta e_{\$j,t} \times S_j$			-0.0903 (0.0871)
R-squared	0.069	0.071	0.074
Observations	52,272	52,272	38,582

Notes: $q_{ij,t}$: import quantities from i to j , $e_{ij,t}$: bilateral ER, $e_{\$j,t}$: ER with respect to the dollar, S_j : dollar invoicing share.

- Again, including dollar ER reduces the relevance of bilateral ER.

Trade Elasticity & Expenditure Switching



Source: Adler et al. (2020).

- Following depreciation, imports decline while exports barely change.
- Over the medium term, exports increase \approx decline in imports.

Summary of Evidence of Allocative Effects

- Strong response of import prices to the dollar versus producer exchange rate (Gopinath et al. 2020, Boz et al. 2020)
 - with the differential effect increasing in USD invoicing share
 - differential consumer price response by currency of invoicing (Auer, Burstein and Lein 2020)
- Stable terms of trade relative to bilateral exchange rates
 - in sharp contrast with PCP, LCP and flex-price PTM
 - direct implications for net exports and expenditure switching, driven mostly by adjustment in imports (Adler et al. 2020)
 - decline in global trade in response to dollar appreciation
- Differential response of export quantities to exchange rates by currency of invoicing (Amiti, Itskhoki and Konings 2020)
- Cashflow, employment and investment sensitivity to exchange rates by currency of invoicing (Barbiero 2019)

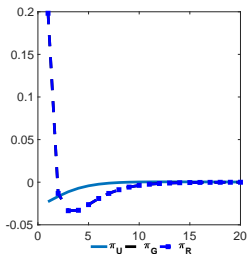
Roadmap

- ① Evidence and positive implications of DCP
- ② Asymmetries in shock transmission
- ③ Optimal monetary and exchange rate policy under DCP
- ④ Endogenous currency choice and global DCP equilibrium

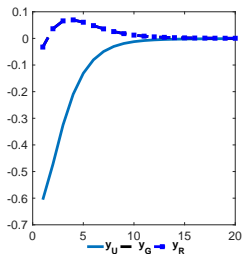
Roadmap

- ① Evidence and positive implications of DCP
- ② Asymmetries in shock transmission
 - 3 countries: U , G , R
 - countries symmetric, except U 's dominant currency
- ③ Optimal monetary and exchange rate policy under DCP
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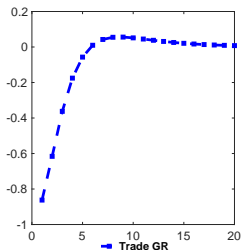
Monetary Policy Tightening in DC



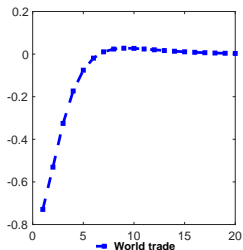
(a) Inflation



(b) Output

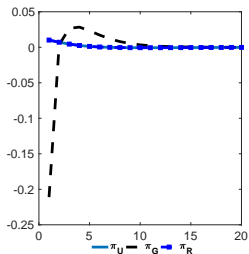


(c) ROW trade

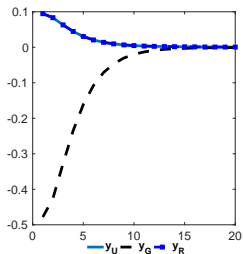


(d) World trade

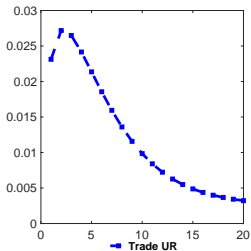
Monetary Policy Tightening in Non-DC



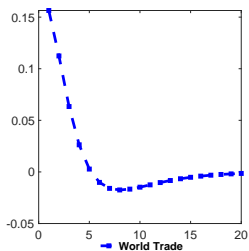
(a) Inflation



(b) Output



(c) ROW trade



(d) World trade

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Monetary Policy

Canonical Representation. Under DCP, the evolution of inflation, output gap and law of one price departures from flexible prices follow:

$$\pi_{HH,t} = \frac{\lambda_p}{\gamma} [\tilde{y}_t - (1 - \gamma)\tilde{s}_t] + \beta\mathbb{E}_t\pi_{HH,t+1} \quad [NKPC]$$

$$\tilde{y}_t = \mathbb{E}_t\tilde{y}_{t+1} - (i_t - \mathbb{E}_t\pi_{HH,t+1} - r_t^n) + (1 - \gamma)\mathbb{E}_t(\Delta\tilde{m}_{t+1}) \quad [IS]$$

$$\tilde{m}_t = \frac{1}{\gamma} (\tilde{y}_t - \tilde{s}_t) \quad [LOOP]$$

Welfare Loss Function.

$$\mathbb{W}^{DCP} \approx \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t \left[\frac{1}{2}\tilde{y}_t^2 + \gamma \frac{\sigma}{2\lambda_p} \pi_{HH,t}^2 + \frac{\gamma(1-\gamma)}{2} \tilde{m}_t^2 \right] + t.i.p$$

Monetary Policy

Canonical Representation. Under DCP, the evolution of inflation, output gap and law of one price departures from flexible prices follow:

$$\pi_{HH,t} = \frac{\lambda_p}{\gamma} [\tilde{y}_t - (1 - \gamma)\tilde{s}_t] + \beta\mathbb{E}_t\pi_{HH,t+1} \quad [NKPC]$$

$$\tilde{y}_t = \mathbb{E}_t\tilde{y}_{t+1} - (i_t - \mathbb{E}_t\pi_{HH,t+1} - r_t^n) + (1 - \gamma)\mathbb{E}_t(\Delta\tilde{m}_{t+1}) \quad [IS]$$

$$\tilde{m}_t = \frac{1}{\gamma} (\tilde{y}_t - \tilde{s}_t) \quad [LOOP]$$

Instead, under PCP: $\pi_{HH,t} = \lambda_p\tilde{y}_t + \beta\mathbb{E}_t\pi_{HH,t+1}$.

Welfare Loss Function.

$$\mathbb{W}^{DCP} \approx \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t \left[\frac{1}{2}\tilde{y}_t^2 + \gamma \frac{\sigma}{2\lambda_p} \pi_{HH,t}^2 + \frac{\gamma(1-\gamma)}{2} \tilde{m}_t^2 \right] + t.i.p$$

$$\mathbb{W}^{PCP} \approx \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t \gamma_H \left[\frac{1}{2}\tilde{y}_t^2 + \frac{\sigma}{2\lambda_p} \pi_{HH,t}^2 \right] + t.i.p$$

Optimal Policy under DCP: Main Facts

- DCP calls for producer price inflation targeting and flexible exchange rates.
- Not possible to simultaneously attain zero inflation and zero output gap (no “divine coincidence”)
- Output gap fluctuates with terms of trade—exogeneously from MP.
- Benefits from ER flexibility are more limited.

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Currency Choice

- Main facts about currency use in international trade:
 - ① active endogenous choice at the level of the firm
 - ② extremely persistent even over long intervals of time
 - ③ yet subject to decisive shifts over the very long run

- Main theories based on the three uses of money:
 - ① Medium of exchange: transaction cost theories
 - ② Store of value: financing theories
 - ③ Unit of account: sticky price theories
 - most developed theoretically with strong empirical support
 - currency choice attempts to approximate the desired price response in the short run

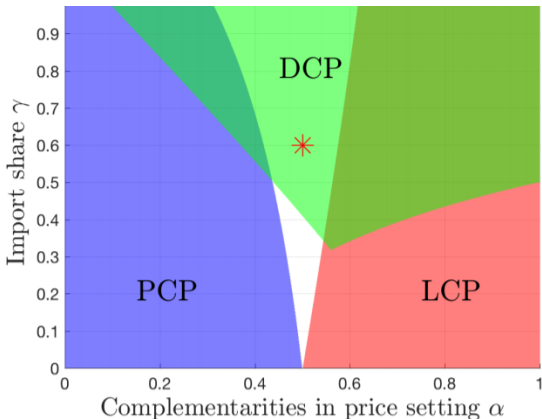
Theory: How is invoicing currency chosen?

Consider a firm's profit function (normalized by market size)

$$\Pi_i = P_i Q_i - MC_i Q_i \Rightarrow \frac{\Pi_i}{Y} = S_i \cdot \left(1 - \frac{1}{\mathcal{M}_i}\right)$$

- With sticky prices, currency choice determines adjustment to ER fluctuations done via markups or market shares.
- Currency choice shaped by properties of *desired* price (Gopinath et al. 2010).
- Medium-run pass-through (MRPT) sufficient statistic for currency choice—choose currency with lowest MRPT (ibid.)
 - MRPT can be measured if price adjustment instances known.
- Currency choice problem is equivalent to finding currency in which desired price is least volatile (Mukhin 2017).

Theory: DCP in General Equilibrium



- Mukhin (2017): DCP equilibrium emerges under certain degree of strategic complementarity and openness in import sourcing and exports.

Empirical Evidence on Currency Choice

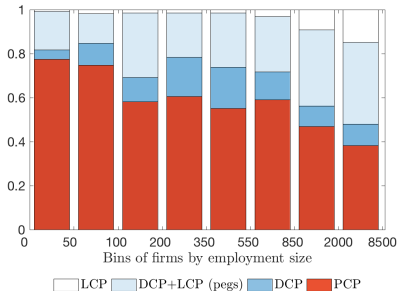
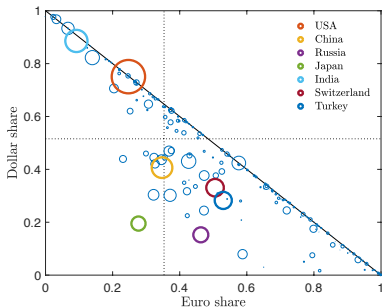
- Currency choice depends on desired pass-through (particularly, MRPT)

	Share Non-Dollar	MRPT		LRPT	
		Dollar	Non-Dollar	Dollar	Non-Dollar
ALL	0.19	0.24 (0.03)	0.92 (0.04)	0.49 (0.06)	0.98 (0.06)
EURO	0.25	0.23 (0.03)	0.92 (0.08)	0.42 (0.09)	0.95 (0.08)
NON-EURO	0.15	0.23 (0.05)	0.85 (0.11)	0.56 (0.09)	0.96 (0.12)

Source: Gopinath et al (2010). Note: the sample includes 12 countries with a non-trivial share of non-dollar-priced exports to the United States.

Empirical Evidence on Currency Choice II

- Can MRPT be traced back to primitive firm characteristics?
- Consider Belgian ex-EU exports



Source: Amiti, Itskhoki and Konings (2020).

- Strong relationship of currency choice with firm characteristics
 - firm size, imported intermediate inputs, global value chains

Empirical Evidence on Currency Choice II (cont.)

	Non-euro, ι_{ikt}		Dollar, ι_{ikt}^D	
	(1)	(2)	(3)	(4)
Import intensity	0.326** (0.165)	0.368* (0.194)	0.457*** (0.156)	0.729*** (0.216)
Firm size	0.082*** (0.015)	0.054*** (0.013)	- 0.079*** (0.010)	- 0.095*** (0.022)
Firm's FDI		0.121*** (0.043)		0.107* (0.060)
Competitor currency		0.620** (0.277)		1.516** (0.697)
Observations	734, 012	656, 389	111, 606	104, 584

Notes: observations are at the Belgian firm-product (CN8)-destination-month level for all ex-EU destinations from February 2017 to March 2019. The dependent variables: $\iota_{ikt} = 0$ if the export transaction is invoiced in euros and 1 otherwise; $\iota_{ikt}^D = 1$ if the export transaction is invoiced in dollars.

Future Work

- Transmission from border prices to producer costs, consumer prices, and quantities
 - distribution margin, firm-to-firm trade, global supply networks
- Extensive-margin allocative effects of DCP
 - entry and exit of firms and products
- Empirical work linking (dollar) financing and (dollar) pricing decisions at the level of the firm
- Interaction between currency choice and nominal anchoring (currency unions and pegs)
- Welfare effects of the dominant currency