Markets vs. policies: Can the US dollar's dominance in global trade be dented?

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Motivation

- USD is the dominant currency in global trade invoicing
  Gopinath (2015); Boz et al. (2022)

- Important implications for dynamics of global financial system
  Caballero et al. (2008); Gourinchas and Rey (2013); Mukhin (2018); Gourinchas (2019); Miranda-Agrippino and Rey (2020)

- EUR initially thought to but eventually did not challenge USD's dominant status
  Chinn and Frankel (2008)
  - But why is a significant share of world trade still invoiced in non-USD, especially EUR?

- China is becoming an ever more important player in the global economy
  Eichengreen (2011); Eichengreen and Lombardi (2017)
  - Will the RMB be a more successful challenger to the USD?

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This paper

- EUR vs. USD: 'Markets'
  - International role of the EUR has been a 'market-driven process'
    European Central Bank (2018)
  - Do market determinants of invoicing currency choice predicted by theory underpin the use of the EUR and thereby limit USD dominance?
- RMB vs. USD (and EUR): 'Policies'
  - RMB internationalisation (so far) largely driven by policy initiatives
    Chen and Cheung (2011); Frankel (2012); Prasad (2016)
  - Has the RMB started to erode the USD's (and/or the EUR's) status?
- Exploit global invoicing dataset of Boz et al. (2022) for 100+ countries over 1999-2019

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Findings

- EUR vs. USD: ‘Markets’
  - Trade and GVC integration with EA underpin EUR invoicing and limit USD dominance
- RMB vs. USD (and EUR): ‘Policies’
  - PBoC swap lines followed by greater RMB invoicing, at expense of USD and EUR

1. EUR vs. USD: 'Markets'
   - EUR internationalisation
   - Theory on the determinants of invoicing currency choice
   - Stylised facts on USD and EUR invoicing
   - Regression results
2. RMB vs. USD (and/or EUR): 'Policies'
   - RMB internationalisation
   - Stylised facts on RMB invoicing
   - Regression results
     - Strengthening trade ties with CHN
     - PBoC swap lines
3. Conclusion

EUR internationalisation

- International role of the euro "essentially a market-driven process" since Day 1
  European Central Bank (2018)
- Reflection of a compromise between those in favour of internationalisation and those against (ECB neutral position to "neither hinder, nor foster")
- Very recently—after our sample period—more open attitude among European authorities towards fostering the euro's role
  - Concrete initiatives proposed by the European Commission (2018)
  - Support from EA Heads of State and governments: Europe's 'strategic autonomy'
  - ECB support through sound policies, Banking Union and Capital Market Union that ultimately support the euro
    Panetta (2020)

Theory on the determinants of invoicing currency choice

- Firm invoicing currency choice minimises deviations of pre-set from optimal flex price
  Bacchetta and van Wincoop (2005); Novy (2006); Goldberg and Tille (2008); Gopinath et al. (2010); Mukhin (2018)

- Strategic complementarities in price setting imply optimality of
  - LCP for exports to US/EA to limit deviations from local competitors' prices
  - DCP for third-country trade to limit deviations from international competitors' prices

- Cross-border input-output linkages imply optimality of
  - PCP for exports of US/EA due to stability of marginal costs
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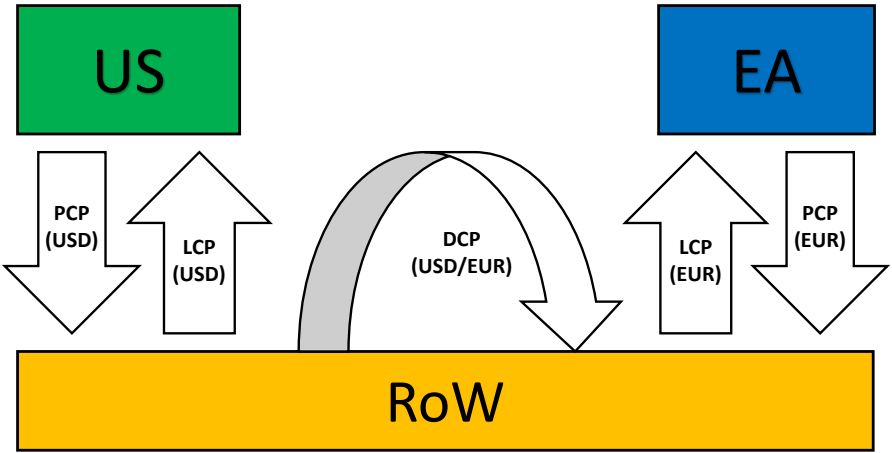
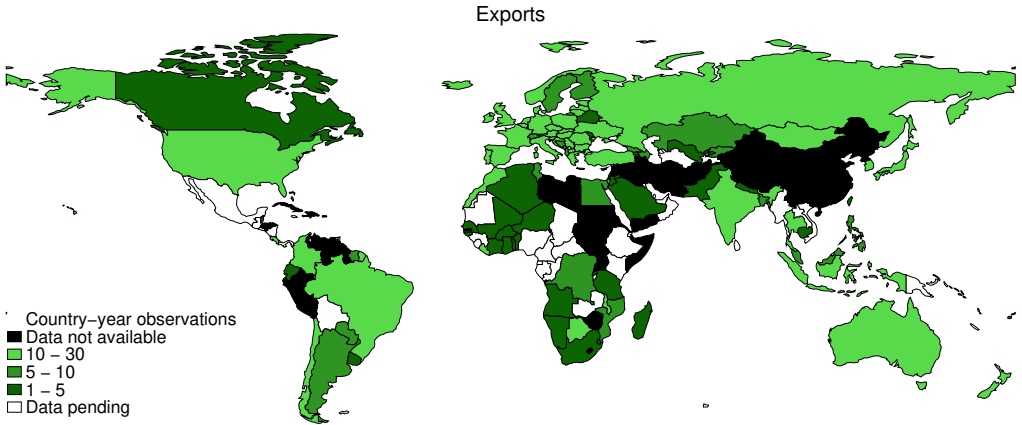


USD/EUR country/time coverage in the dataset of Boz et al. (2022)



Note: The figure shows the global country coverage of our data on US dollar export invoicing shares. Different shades of green correspond to different numbers of available annual observations. For the countries marked in black, data are either unavailable (as confirmed by national authorities) or have not been requested. Countries marked in white are those for which data requests are pending. Based on an updated version of the dataset of Boz et al. (2022).

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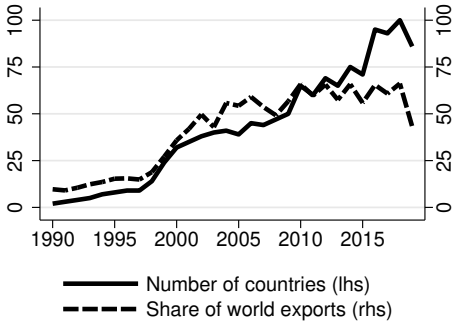
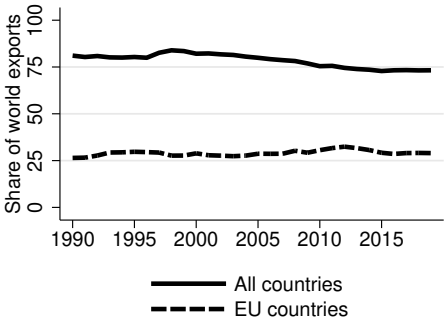
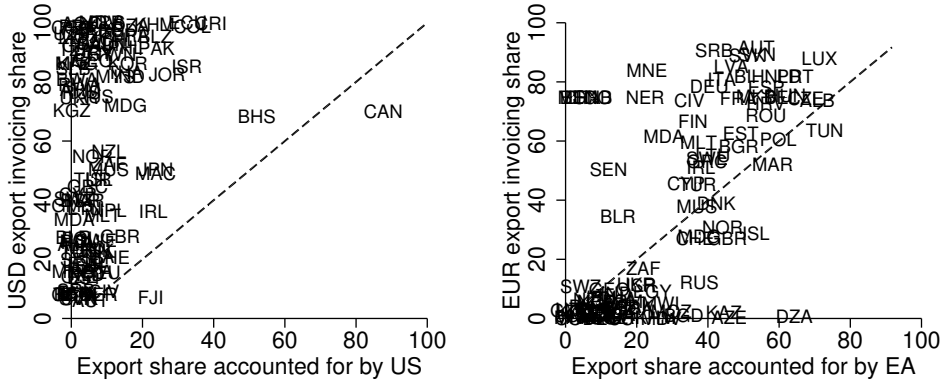




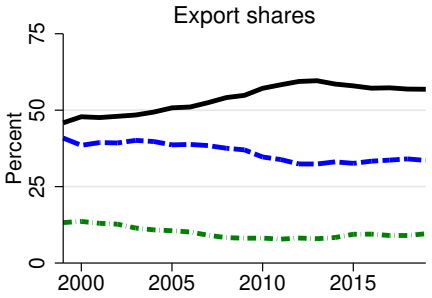
Note: The figure plots the coverage of the data on the invoicing currency shares of exports over time. The left-hand side panel shows the evolution of our country count and of the share of world exports covered in the raw data; the right-hand side panel shows the share of world exports that our data cover after interpolation and extrapolation. Based on an updated version of the dataset of Boz et al. (2022).

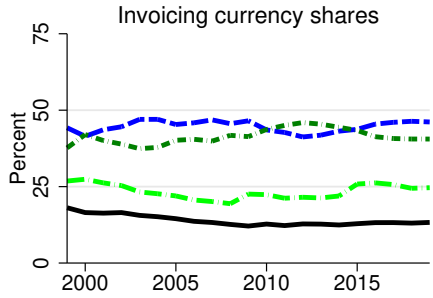
Share of exports accounted for by US/EA and invoiced in USD/EUR



Note: The figure presents scatter plots of the share of countries' total exports accounted for by the US and the share of total exports invoiced in USD (left panel) as well as the share of total exports accounted for by the EA and the share of total exports invoiced in EUR (right panel). Based on an updated version of the dataset of Boz et al. (2022).

Global trade and invoicing currency shares over time





Note: The left panel depicts the evolution of the share of exports to the US, the EA, and the rest of the world in total global exports; the right panel plots the share of global exports that are invoiced in US dollars, euros, and other currencies. Only exports to countries for which we have invoicing data are considered. The graphs are based on interpolated and extrapolated data. Based on an updated version of the dataset of Boz et al. (2022).

Theoretical predictions for invoicing currency choice

- USD/EUR export invoicing higher when
  1. share of a country's exports accounted for by US/EA is greater (LCP)
  2. a country is integrated in cross-border input-output linkages (DCP)
  3. a country is exposed to strategic complementarities (DCP)
- USD/EUR import invoicing higher when
  4. share of a country's imports accounted for by US/EA is greater (PCP)

Regression results

- Run regressions

$$S_{i,t}^{\ell} = \alpha_i^{\ell} + \tau_t^{\ell} + \boldsymbol{\beta}^{\ell\prime}\boldsymbol{W}_{i,t}^{\ell} + \boldsymbol{\gamma}^{\ell\prime}\boldsymbol{Z}_{i,t}^{\ell} + u_{i,t}^{\ell} \tag{1}$$

  - $S_{i,t}^{\ell}$: Share of country i's exports invoiced in currency $\ell \in \{\$, €\}$
  - $\boldsymbol{Z}_{i,t}^{\ell}$: Controls (bilateral exchange rates)
  - α_i^{ℓ}, τ_t^{ℓ}: Country and time fixed effects

- Explanatory variables of interest $\boldsymbol{W}_{i,t}^{\ell}$ include
  - Share of total exports accounted for by US/USD block and EA/EUR block
    Based on IMF DoTS data and Ilzetzki et al. (2019)
  - Exposure to strategic complementarities in export markets
    Based on Rauch (1999) and COMTRADE data
  - Backward GVC integration
    Based on UNCTAD/EORA data of Lenzen et al. (2013)

- Sample: 1999-2019

LCP in exports to US?

	USD			EUR		
	(1) Base-line	(2) No EA	(3) No Europe	(4) Base-line	(5) No EA	(6) No Europe
Share of X to US/EA in total X	0.81***	0.78***	0.95***	0.27***	0.19**	0.12***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Share of X to non-US USD/non-EA EUR block in total X	0.20***	0.17***	0.16***	0.14***	0.14***	0.05***
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Share of homogeneous goods in total X	0.23***	0.26***	0.12**	-0.13***	-0.13***	-0.05***
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Backward GVC integration	-0.14	0.12	0.06	0.29**	-0.00	0.02
	(0.32)	(0.30)	(0.49)	(0.03)	(0.97)	(0.79)
Within R-squared	0.32	0.35	0.51	0.36	0.41	0.22
Observations	1018	726	467	1025	729	470
Countries	92	74	57	91	73	56

LCP in exports to EA?

	USD			EUR		
	(1) Base-line	(2) No EA	(3) No Europe	(4) Base-line	(5) No EA	(6) No Europe
Share of X to US/EA in total X	0.81***	0.78***	0.95***	0.27***	0.19**	0.12***
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DCP in exports due to GVCs and strategic complementarities?

	USD			EUR		
	(1) Base-line	(2) No EA	(3) No Europe	(4) Base-line	(5) No EA	(6) No Europe
Share of X to US/EA in total X	0.81***	0.78***	0.95***	0.27***	0.19**	0.12***
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PCP in imports from US?

	USD			EUR		
	(1) Base-line	(2) No EA	(3) No Europe	(4) Base-line	(5) No EA	(6) No Europe
Share of M from US/EA in total M	0.16*	0.01	0.24**	0.42***	0.19***	0.14*
	(0.09)	(0.89)	(0.01)	(0.00)	(0.01)	(0.08)
Share of M from non-US USD/non-EA EUR block in total M	0.42***	0.35***	0.35***	0.40**	0.28	0.10
	(0.00)	(0.00)	(0.00)	(0.02)	(0.13)	(0.25)
Share of homogeneous goods in total M	0.26***	0.23***	0.29***	-0.03	0.03	0.04
	(0.00)	(0.00)	(0.00)	(0.55)	(0.45)	(0.22)
Trading-partners' backward GVC integration	0.10	0.35	-1.82	-0.64	-1.27**	0.24
	(0.86)	(0.58)	(0.11)	(0.18)	(0.03)	(0.39)
Within R-squared	0.23	0.21	0.29	0.30	0.27	0.25
Observations	1101	808	528	1098	800	520
Countries	99	81	61	98	80	60

PCP in imports from EA?

	USD			EUR		
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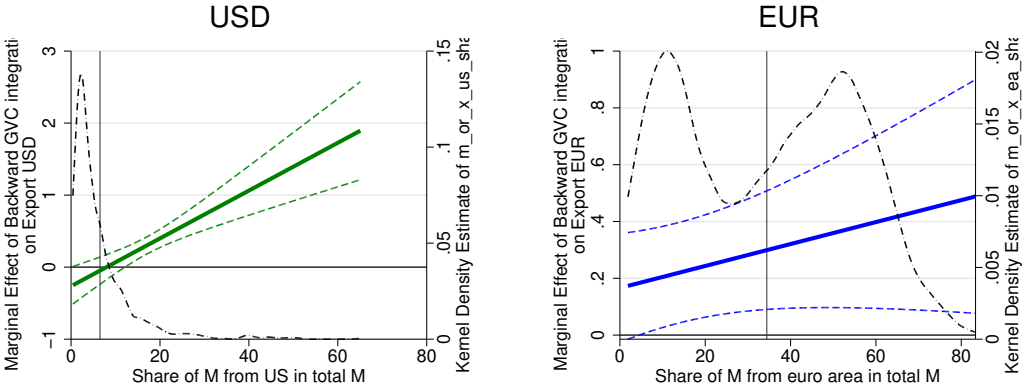
The role of backward GVC integration

- Results for GVC inconclusive: Does it matter in which VC a country is integrated?
- Run regressions

$$S_{i,t}^{\ell} = \alpha_i^{\ell} + \tau_t^{\ell} + \boldsymbol{\beta}^{\ell\prime}\boldsymbol{W}_{i,t}^{\ell} + b^{\ell}\left(backwGVC_{i,t} \times \omega_{i,t}^{\ell'}\right) + \boldsymbol{\gamma}^{\ell\prime}\boldsymbol{Z}_{i,t}^{\ell} + u_{i,t}^{\ell} \tag{2}$$

  - $backwGVC_{i,t}$: Country i's backward GVC integration $\ell \in \{\$, €\}$
  - $\omega_{i,t}^{\ell'}$: Country i's share of imports accounted for by US/EA, $\ell' = US\,(EA)$ if $\ell = \$\,(€)$

GVC integration and non-European countries' USD/EUR invoicing



Note: The figure presents the marginal effects of GVC integration on US dollar and euro invoicing. The solid black line indicates the point estimate, the dashed blue lines 90% confidence bands, and the red dash-dotted lines kernel density estimates of the distribution of the share of countries' total exports/imports accounted for by exports to/imports from the US/EA.

EUR vs. USD: 'Markets' — Summary

- Data consistent with theoretical predictions on invoicing currency choice
  - PCP and LCP in trade with US/EA
  - Strategic complementarities and GVC integration favour DCP
- USD vs. EUR
  - Only USD emerges under DCP
  - EUR use bolstered largely by intra-European trade

1. EUR vs. USD: 'Markets'
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2. RMB vs. USD (and/or EUR): 'Policies'
   - RMB internationalisation
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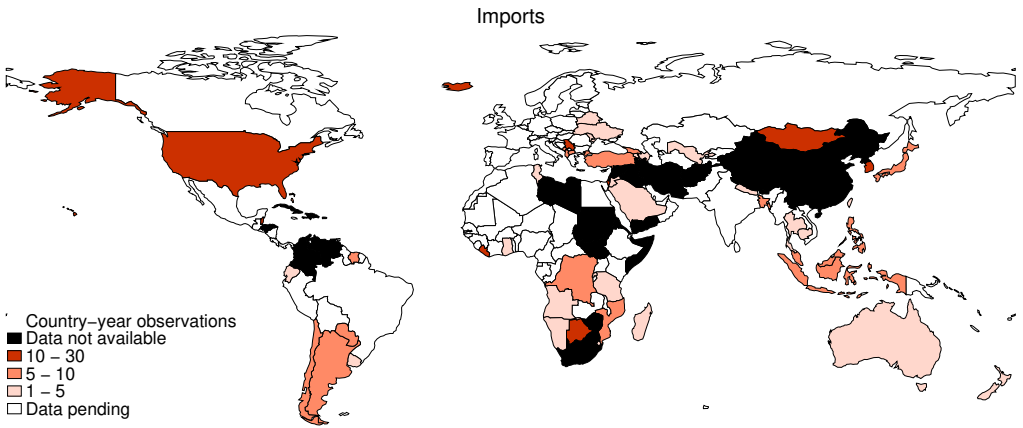
     - Strengthening trade ties with CHN
     - PBoC swap lines
3. Conclusion

CHN's rise and RMB internationalisation

- CHN has become a major player in the global economy, set to take off even further
- Natural question whether RMB will challenge the USD
  (Eichengreen, 2011; Eichengreen and Lombardi, 2017)
- So far RMB internationalisation is policy-driven process, e.g.
  (Chen and Cheung, 2011; Frankel, 2012; Prasad, 2016)
  - Pilot Programme of RMB Settlement of Cross-border Trade Transactions
  - PBoC swap lines
- Has the RMB started to erode the USD's (and/or the EUR's) status?
- Explore non-publicly available RMB part of the dataset of Boz et al. (2022)

RMB country/time coverage in the dataset of Boz et al. (2022)



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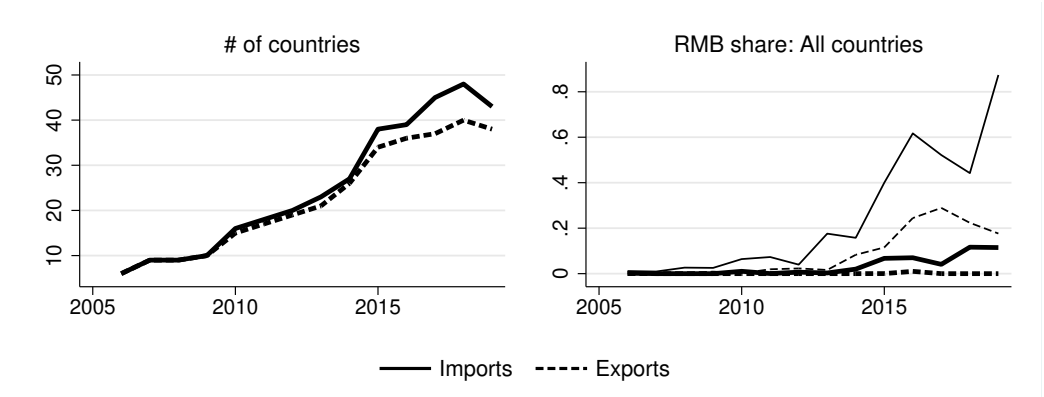


Note: The figure depicts the evolution of the number of countries for which renminbi invoicing data is available (right-hand side panel) and the median renminbi invoicing share over time (right-hand side panel). Data for Mongolia are not included to avoid distortions.

Regression specification

- Run regressions

$$S_{i,t}^{\ell} = \alpha_i^{\ell} + \tau_t^{\ell} + \boldsymbol{\beta}^{\ell\prime}\boldsymbol{W}_{i,t}^{\ell} + \boldsymbol{\gamma}^{\ell\prime}\boldsymbol{Z}_{i,t}^{\ell} + u_{i,t}^{\ell} \tag{3}$$

  - $S_{i,t}^{\ell}$: Share of country i's imports invoiced in currency $\ell \in \{\$, €, ¥, \text{other}\}$
  - $\boldsymbol{Z}_{i,t}^{\ell}$: Controls (GVC integration, strategic complementarities, bilateral FX)
  - α_i^{ℓ}, τ_t^{ℓ}: Country and time fixed effects

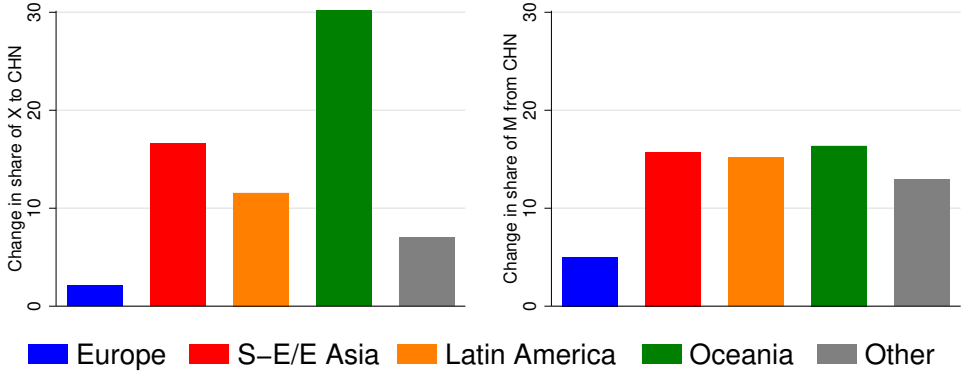
- Explanatory variables of interest $\boldsymbol{W}_{i,t}^{\ell}$ include
  - Share of total imports accounted for by US, EA, and CHN

- Start in 2011 when Pilot Project extended to trade with the whole world

Baseline regression results for RMB import invoicing

	(1) USD	(2) EUR	(3) RMB	(4) Other
Share of M from CH in total M	0.30**	-0.11	0.02	-0.15
	(0.04)	(0.28)	(0.16)	(0.35)
Within R-squared	0.26	0.34	0.24	0.09
Observations	301	301	262	301
Countries	49	49	49	49

Strengthening trade ties with CHN



Note: The figure shows the average level and change in the share of countries' imports accounted for by China for the 1999-2019 period, where "S-E/E Asia" stands for "Southeast Asia and East Asia". The data are from the IMF DoTS. Note that when $0.5(x_T + x_0) = x_T - x_0$ then $x_T = 3x_0$, meaning that trade shares accounted for by China have roughly tripled.

Regression results for RMB import invoicing by region

	(1) USD	(2) EUR	(3) RMB	(4) Other
Share of M from CH in total M				
x Europe dummy	-0.66**	1.36***	-0.06***	-0.94***
	(0.01)	(0.00)	(0.00)	(0.00)
x S-E/E Asia dummy	0.65***	-0.24**	0.10***	-0.44***
	(0.00)	(0.02)	(0.00)	(0.00)
x Latin America dummy	0.45*	-0.23*	-0.02	-0.18
	(0.05)	(0.05)	(0.11)	(0.45)
x Oceania dummy	1.30*	-0.53***	0.12***	-0.82
	(0.09)	(0.00)	(0.00)	(0.35)
x Sub-Saharan Africa dummy	-0.26	0.04	0.01	0.21
	(0.43)	(0.73)	(0.48)	(0.44)
Within R-squared	0.34	0.43	0.37	0.16
Observations	301	301	262	301
Countries	49	49	49	49

Strengthening trade ties with CHN: 'Policies' — Summary

- European countries
  - Greater EUR invoicing
  - At expense of USD and other currencies
- SE/E Asian and Oceanian countries
  - Greater USD and RMB invoicing
  - At expense of other currencies
- Consistent with increasing concentration of invoicing and rise of RMB

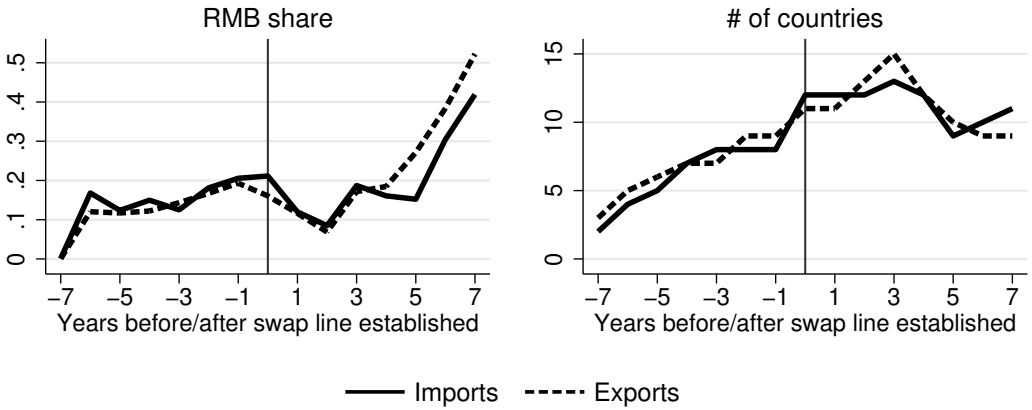
PBoC swap lines and RMB invoicing

- PBoC has signed 40+ swap agreements with other central banks
  Direction Générale du Trésor (2018) as well as Bahaj and Reis (2020)
- Stated objective: Facilitate RMB trade settlement
  People's Bank of China (2012)
- Theory suggests swap lines may render RMB trade finance more stable/reliable
  Bahaj and Reis (2020)
- Some evidence for increasing RMB invoicing (or settlement) due to PBoC swap line
  Song and Xia (2019); Bahaj and Reis (2020)
- But at whose expense?

RMB invoicing for countries with and without PBoC swap line

Note: The figure depicts the evolution of the median RMB invoicing share separately for countries which established a swap line with the PBoC (left-hand side panel) and for those that did not (right-hand side panel). Data for Mongolia are not included to avoid distortions.

RMB invoicing before and after PBoC swap line establishment



Note: The figure depicts the evolution of the mean RMB invoicing share over time around the establishment of a swap line with the PBoC (indicated by the vertical line). The horizontal axis indicates years prior and after the establishment of a PBoC swap line.

Regressions for PBoC swap lines and RMB invoicing

- Run regressions

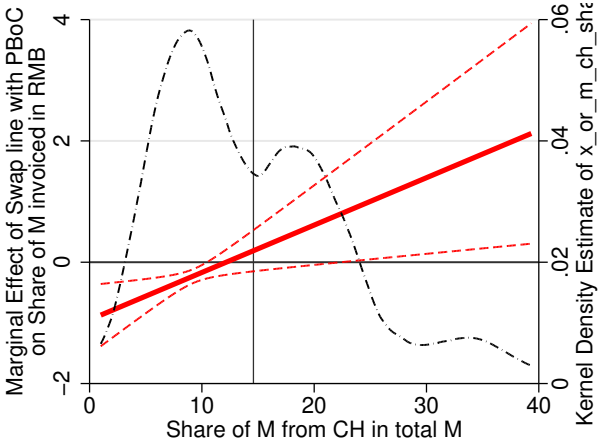
$$S_{i,t}^{\ell} = \alpha_i^{\ell} + \tau_t^{\ell} + b^{\ell} \left(PBoCSwap_{i,t} \times \omega_{i,t}^{CHN} \right) + \boldsymbol{\gamma}^{\ell\prime} \mathbf{Z}_{i,t}^{\ell} + u_{i,t}^{\ell} \tag{4}$$

  - $S_{i,t}^{\ell}$: Share of country i's imports invoiced in currency $\ell \in \{\$, €, ¥\}$
  - $PBoCSwap_{i,t}$: PBoC swap line dummy
  - $\omega_{i,t}^{CHN}$: Share of imports accounted for by CHN

- Start regressions already in 2008 when first swap line was established

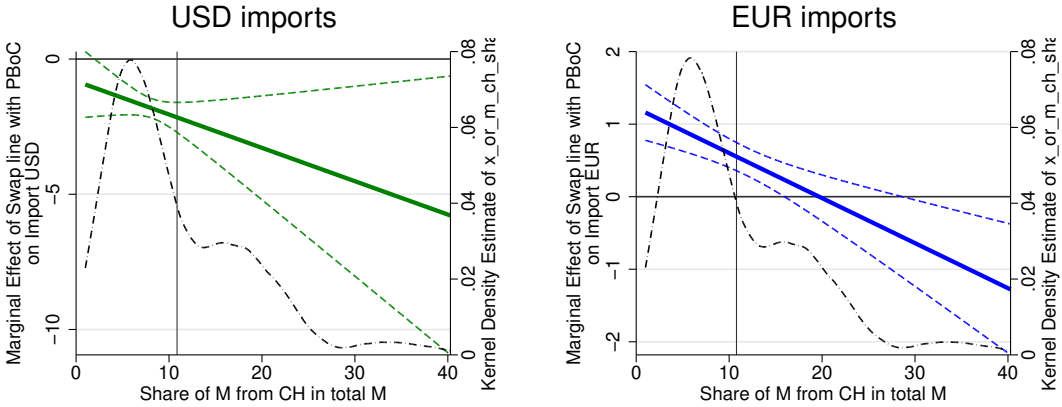
- Control for additional measures of CHN's foreign policy in robustness checks
  Bahaj and Reis (2020)
  - RMB clearing bank, FTA with CHN, infrastructure investment flows from CHN

Results for PBoC swap lines and RMB import invoicing



Note: The figure presents the marginal effects of PBoC swap lines on RMB invoicing. The results for exports are shown in the left-hand side column, and those for imports in the right-hand side column. The solid thick line indicates the point estimate, the dashed lines 90% confidence bands, and the black dash-dotted lines kernel density estimates of the distribution of the share of countries' total exports/imports accounted for by exports to/imports from CHN.

Results for PBoC swap lines and USD/EUR import invoicing



Note: The figure presents the marginal effects of PBoC swap lines on USD and EUR import invoicing. The results for USD are shown in the left-hand side column in green lines, and those for EUR in blue lines in the right-hand side column. The solid thick line indicates the point estimate, the dashed lines 90% confidence bands, and the black dash-dotted lines kernel density estimates of the distribution of the share of countries' total exports/imports accounted for by exports to/imports from CHN.

PBoC swap lines and RMB invoicing: 'Policies' — Summary

- PBoC swap lines associated with greater RMB invoicing
- but only for countries with strong trade ties with CHN
- RMB invoicing associated with PBoC swap lines at the expense of USD and EUR

1. EUR vs. USD: ‘Markets’
   - EUR internationalisation
   - Theory on the determinants of invoicing currency choice
   - Stylised facts on USD and EUR invoicing
   - Regression results
2. RMB vs. USD (and/or EUR): ‘Policies’
   - RMB internationalisation
   - Stylised facts on RMB invoicing
   - Regression results
     - Strengthening trade ties with CHN
     - PBoC swap lines
3. Conclusion

Conclusion

- EUR vs. USD: ‘Markets’
  - Europe’s GVC integration and trade integration have held up EUR invoicing and limited USD dominance
  - Will European integration deepen further, stall or recede?
- RMB vs. USD/EUR: ‘Policies’
  - Rising RMB invoicing as trade ties with CHN strengthen mostly at expense of non-USD/EUR currencies so far
  - PBoC swap lines associated with rising RMB invoicing at expense of USD and EUR

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