

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

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The views expressed in the paper are those of the authors and not those of the ECB.

Motivation

- USD is the dominant currency in global trade invoicing
Gopinath (2015); Boz et al. (2020)
- 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?

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 the limitation of 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. (2020) for 114 countries over 1999-2018

Findings

- EUR vs. USD: 'Markets'
 - ▶ GVC integration and bilateral trade integration with EA underpin EUR invoicing
 - ▶ EUR invoicing generally at expense of USD
- RMB vs. USD (and EUR): 'Policies'
 - ▶ RMB invoicing growing along with strengthening trade ties with CHN, especially for SE/E-Asian/Oceanian countries, at expense of EUR but not USD
 - ▶ PBoC swap lines followed by greater RMB invoicing, at expense of both EUR and USD

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
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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)

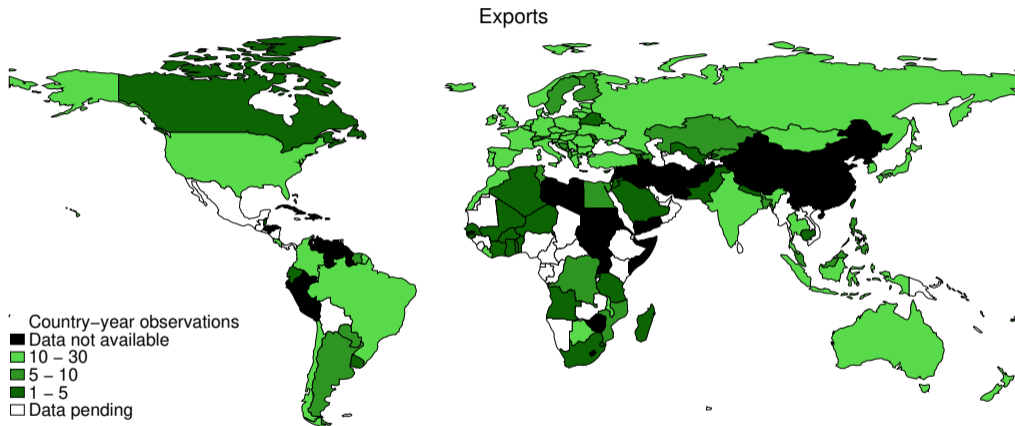
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Theory on the determinants of invoicing currency choice

- Firm invoicing currency choice minimises deviations of preset from optimal flex-price
Bacchetta and van Wincoop (2005); Novy (2006); Goldberg and Tille (2008); Gopinath et al. (2010); Mukhin (2018)
- Vehicle-currency invoicing optimal
 - ▶ in presence of **strategic complementarities in price setting**
⇒ Limit deviations from competitors' prices in destination-currency terms
 - ▶ when imported intermediates are used for the production of exports (**GVCs**)
⇒ Synchronise variations in marginal costs and marginal revenues
- Other determinants include FX volatility/transaction costs, bargaining power
Devereux et al. (2004); Novy (2006); Goldberg and Tille (2013)

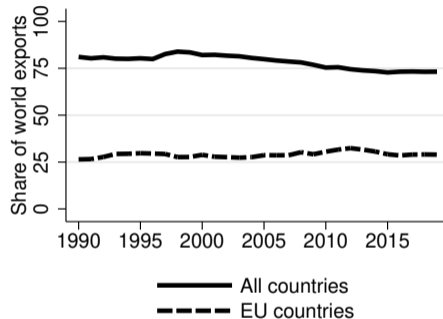
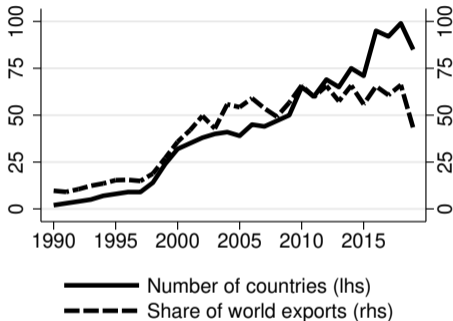
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USD/EUR country/time coverage in the dataset of Boz et al. (2020)



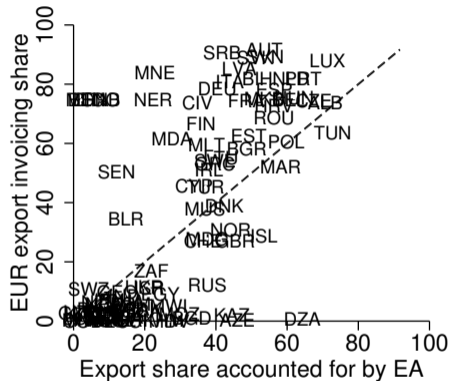
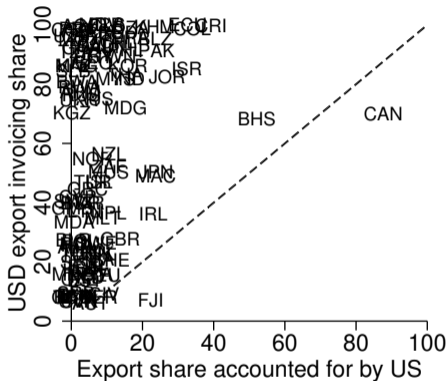
Note: The figure shows the global country coverage of our data on US dollar export invoicing shares. Different shades of green correspond to different numbers of available annual observations. For the countries marked in black, data are either unavailable (as confirmed by national authorities) or have 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. (2020).

USD/EUR country/time coverage in the dataset of Boz et al. (2020)



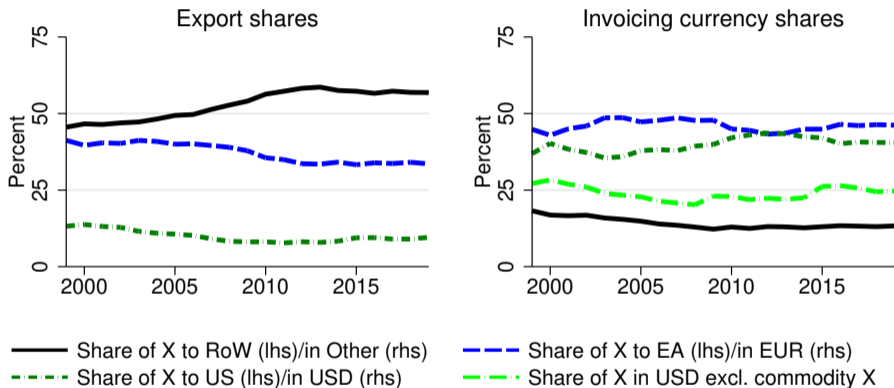
Note: The figure plots the coverage of the data on the invoicing currency shares of exports over time. The left-hand side panel shows the evolution of our country count and of the share of world exports covered in the raw data; the right-hand side panel shows the share of world exports that our data cover after interpolation and extrapolation. Based on an updated version of the dataset of Boz et al. (2020).

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. (2020).

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. (2020).

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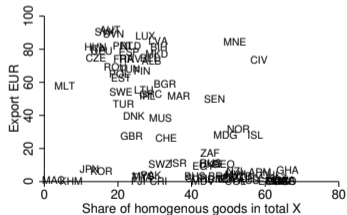
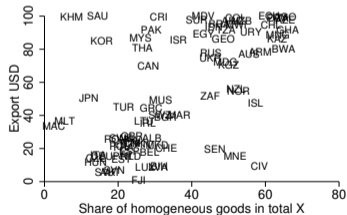
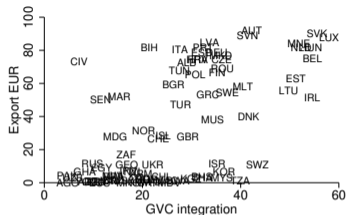
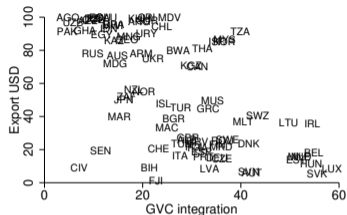
Regression results

- We run regressions

$$S_{i,t}^{\ell} = \alpha_i^{\ell} + \tau_t^{\ell} + \beta^{\ell'} \mathbf{W}_{i,t} + \gamma^{\ell'} \mathbf{Z}_{i,t} + u_{i,t}^{\ell} \quad (1)$$

- ▶ $S_{i,t}^{\ell}$: Share of country i 's exports invoiced in currency $\ell \in \{\$, \text{€}\}$
 - ▶ $\mathbf{Z}_{i,t}$: Controls (bilateral exchange rates)
 - ▶ $\alpha_i^{\ell}, \tau_t^{\ell}$: Country and time fixed effects
-
- Explanatory variables of interest $\mathbf{W}_{i,t}$ include
 - ▶ 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)
 - ▶ Share of total exports accounted for by US and EA
Based on IMF DoTS data
-
- Run regressions for 1999-2018

Unconditional scatterplots



Note: The panels show unconditional cross-sectional correlations between backward GVC integration, the share of homogeneous goods in exports, and US dollar/euro invoicing shares. The data are averaged over time.

Regression results

| | USD | | | | EUR | | | |
|---------------------------------------|----------------------|----------------------|-------------------|---------------------|----------------------|----------------------|--------------------|---------------------|
| | (1) Base- line | (2) Since 1990 | (3) No EA | (4) No Europe | (5) Base- line | (6) Since 1990 | (7) No EA | (8) No Europe |
| Share of homogeneous goods in total X | 0.27*** (0.00) | 0.35*** (0.00) | 0.32*** (0.00) | 0.17*** (0.00) | -0.12*** (0.00) | -0.16*** (0.00) | -0.12*** (0.00) | -0.05*** (0.00) |
| Backward GVC integration | -0.10 (0.52) | -0.13 (0.30) | 0.23* (0.07) | 0.21** (0.05) | 0.26** (0.04) | 0.24** (0.04) | -0.07 (0.53) | -0.01 (0.91) |
| Share of X to US in total X | 0.61*** (0.00) | 0.59*** (0.00) | 0.57*** (0.00) | 0.76*** (0.00) | 0.05 (0.42) | 0.05 (0.32) | 0.14*** (0.01) | 0.06 (0.23) |
| Share of X to EA in total X | 0.16** (0.01) | 0.23*** (0.00) | 0.30*** (0.00) | 0.27*** (0.00) | 0.16*** (0.00) | 0.09 (0.15) | 0.06 (0.32) | 0.05 (0.16) |
| Within R-squared | 0.30 | 0.32 | 0.36 | 0.51 | 0.34 | 0.39 | 0.39 | 0.22 |
| Observations | 1003 | 1045 | 711 | 454 | 1009 | 1049 | 713 | 456 |
| Countries | 90 | 90 | 72 | 55 | 88 | 88 | 70 | 53 |

Note: The table reports results for regressions of export invoicing shares. Inference is based on Driscoll-Kraay robust standard errors. p -values are reported in parentheses below the point estimates, and * (**) [***] indicates statistical significance at the 10% (5%) [1%] significance level. Bilateral exchange rates, country and time fixed effects are included in all regressions.

Regression results for import invoicing shares

| | USD | | | | EUR | | | |
|--|----------------------|----------------------|-------------------|---------------------|----------------------|----------------------|-------------------|---------------------|
| | (1) Base- line | (2) Since 1990 | (3) No EA | (4) No Europe | (5) Base- line | (6) Since 1990 | (7) No EA | (8) No Europe |
| Share of homogeneous goods in total M | 0.24*** (0.00) | 0.24*** (0.00) | 0.24*** (0.00) | 0.34*** (0.01) | -0.05 (0.32) | -0.06 (0.21) | 0.03 (0.47) | 0.04 (0.34) |
| Trading-partners' backward GVC integration | -0.56 (0.44) | -0.56 (0.38) | 0.07 (0.94) | -1.38 (0.34) | -0.43 (0.34) | -0.30 (0.50) | -1.20** (0.02) | 0.20 (0.55) |
| Share of M from US in total M | -0.16* (0.09) | -0.21** (0.02) | -0.27** (0.03) | -0.06 (0.55) | 0.04 (0.64) | 0.16 (0.17) | 0.11 (0.19) | -0.15** (0.04) |
| Share of M from EA in total M | -0.40*** (0.00) | -0.40*** (0.00) | -0.13 (0.22) | 0.02 (0.88) | 0.43*** (0.00) | 0.43*** (0.00) | 0.24*** (0.00) | 0.15** (0.04) |
| Within R-squared | 0.20 | 0.20 | 0.15 | 0.23 | 0.27 | 0.28 | 0.26 | 0.26 |
| Observations | 1082 | 1130 | 789 | 511 | 1080 | 1126 | 782 | 504 |
| Countries | 96 | 96 | 78 | 58 | 95 | 95 | 77 | 57 |

Note: The table reports results for regressions of import invoicing shares. Inference is based on Driscoll-Kraay robust standard errors. p -values are reported in parentheses below the point estimates, and * (**) [***] indicates statistical significance at the 10% (5%) [1%] significance level. Bilateral exchange rates, country and time fixed fixed effects are included in all regressions.

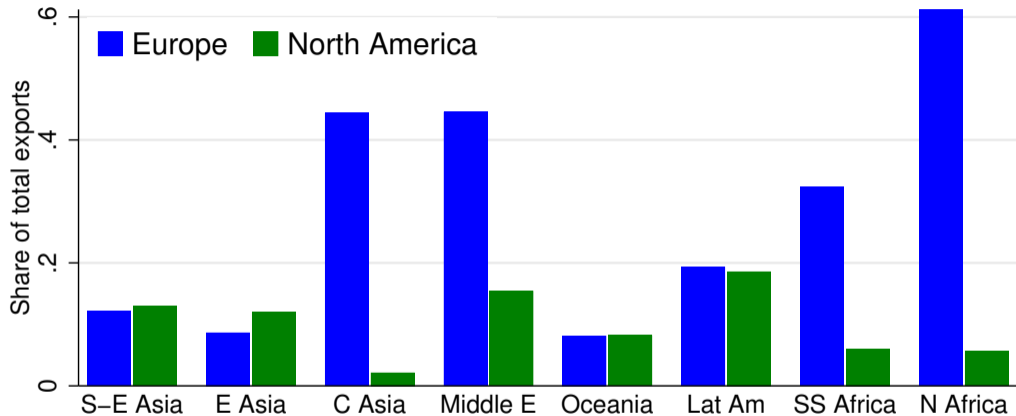
The role of backward GVC integration

- GVC integration associated with greater use of EUR, but potentially only in Europe?
- Run regressions

$$S_{i,t}^{\ell} = \alpha_i^{\ell} + \tau_t^{\ell} + \beta^{\ell'} \mathbf{W}_{i,t} + b^{\ell} \left(\text{backwGVC}_{i,t} \times \omega_{i,t}^{\ell'} \right) + \gamma^{\ell'} \mathbf{Z}_{i,t} + u_{i,t}^{\ell} \quad (2)$$

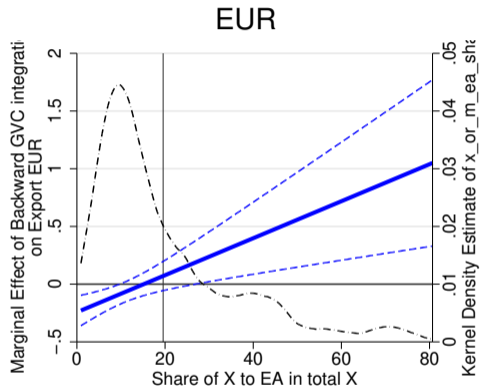
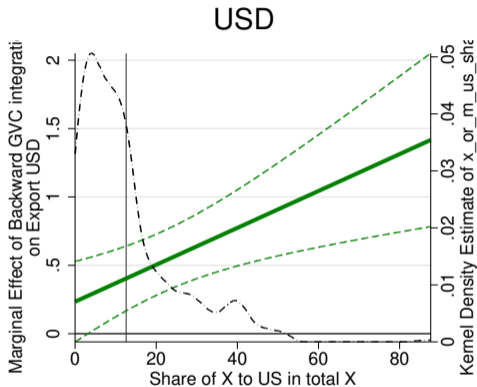
- ▶ $\text{backwGVC}_{i,t}$: Country i 's backward GVC integration $\ell \in \{\$, \text{€}\}$
 - ▶ $\omega_{i,t}^{\ell'}$: Country i 's share of exports accounted for by US/EA, $\ell' = US (EA)$ if $\ell = \$ (\text{€})$
- Consider **non-Europe** country sample

Export shares accounted for by Europe and North America



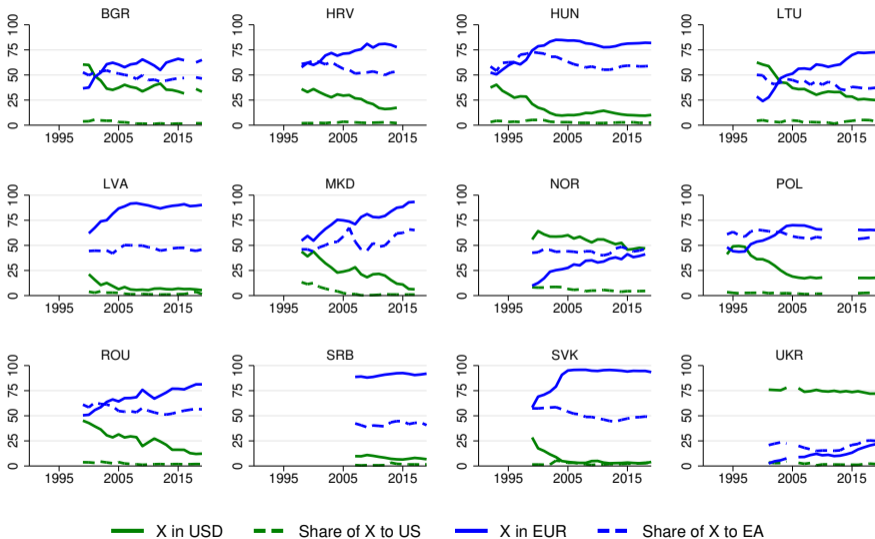
Note: The figure displays the share of goods exports of the countries in a specific region that are accounted for by exports to /imports from Europe and North America. "S-E Asia" stands for Southeast Asia, "E Asia" for East Asia, "C Asia" for Central Asia, "Middle E" for Middle East, "LatAm" for Latin America, "SS Africa" for Sub-Saharan Africa, and "N Africa" for North Africa. We only consider countries which are also used in the regressions. The data are taken from the IMF DoTS.

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.

Invoicing and export shares for selected European countries



EUR vs. USD: Summary

- Data consistent with theoretical predictions regarding the role of market determinants of invoicing currency choice
 - ▶ Strategic complementarities favour USD
 - ▶ GVC integration favours USD or EUR, depending on trading-partner structure
- Key driving forces for EUR's invoicing role: Europe's
 - ▶ importance as destination for global exports
 - ▶ key role in GVCs
- How will these evolve? Especially in the light of the rise of CHN?

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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. (2020)

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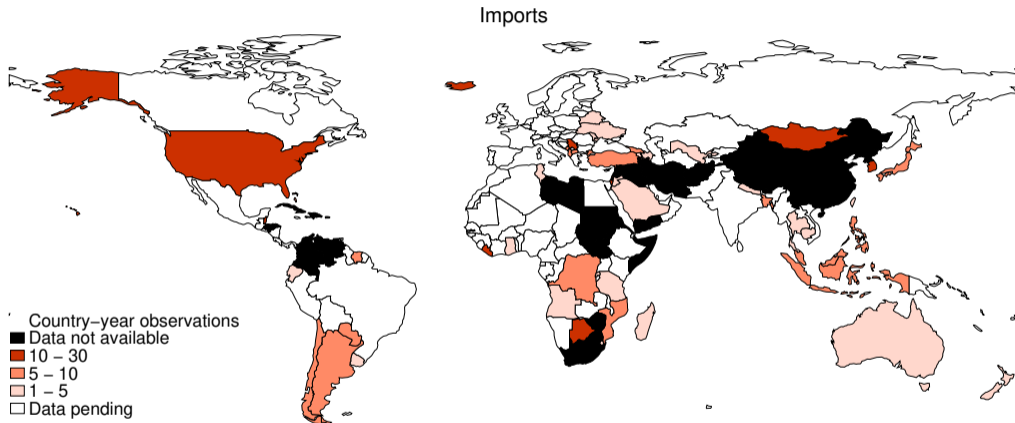
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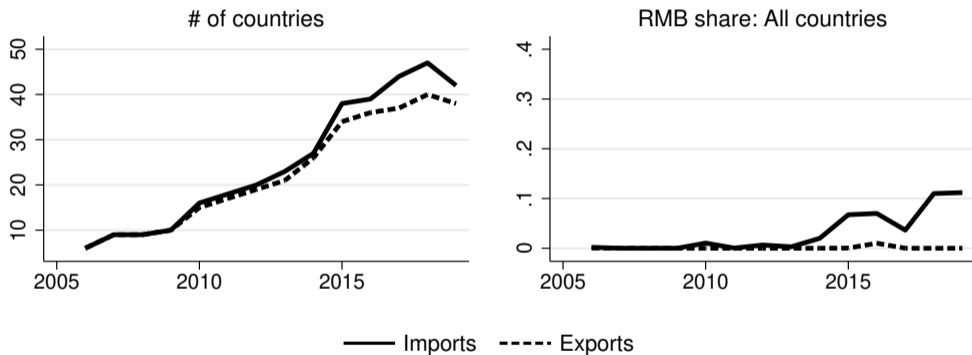
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RMB country/time coverage in the dataset of Boz et al. (2020)



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. (2020).

RMB country/time coverage in the dataset of Boz et al. (2020)



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.

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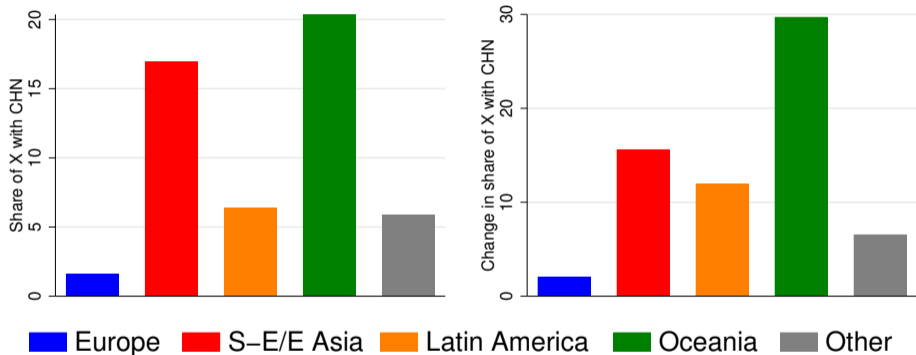
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Strengthening trade ties with CHN



Note: The figure shows the average level and change in the share of countries' exports 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 specification

- We run regressions

$$S_{i,t}^{k,\ell} = \alpha_i^{k,\ell} + \tau_t^{k,\ell} + \beta^{k,\ell'} \mathbf{W}_{i,t}^k + \gamma^{k,\ell'} \mathbf{Z}_{i,t}^k + u_{i,t}^{k,\ell} \quad (3)$$

- ▶ $S_{i,t}^{k,\ell}$: Share of country i 's trade flow $k \in \{x, m\}$ invoiced in currency $\ell \in \{\$, \€, \text{other}, \text{¥}\}$
 - ▶ $\mathbf{Z}_{i,t}^k$: Controls (GVC integration, strategic complementarities, bilateral FX)
 - ▶ $\alpha_i^{k,\ell}, \tau_t^{k,\ell}$: Country and time fixed effects
- Explanatory variables of interest $\mathbf{W}_{i,t}^k$ include
 - ▶ Share of total exports/imports accounted for by US, EA, and CHN
 - Start regressions in 2011 when Pilot Project extended to trade with the whole world

Baseline regression results for RMB invoicing

| | Exports | | | | Imports | | | |
|--------------------------------------|-------------------|-----------------|-------------------|-----------------|----------------|-----------------|-----------------|----------------|
| | (1) USD | (2) EUR | (3) Other | (4) RMB | (5) USD | (6) EUR | (7) Other | (8) RMB |
| Share of X/M to/from CH in total X/M | 0.13*** (0.01) | -0.06 (0.24) | -0.07** (0.01) | 0.03* (0.05) | 0.12 (0.17) | -0.07 (0.22) | -0.05 (0.56) | 0.02 (0.20) |
| Within R-squared | 0.18 | 0.21 | 0.08 | 0.19 | 0.26 | 0.32 | 0.08 | 0.24 |
| Observations | 575 | 580 | 579 | 214 | 626 | 621 | 621 | 259 |
| Countries | 85 | 84 | 84 | 38 | 94 | 93 | 93 | 48 |

Note: Inference is based on Driscoll-Kraay robust standard errors. p -values are reported in parentheses below the point estimates, and * (**) [***] indicates statistical significance at the 10% (5%) [1%] significance level. Country and time fixed effects are included in all regressions. The coefficient estimates for the share of homogeneous goods in total trade, GVC integration, exchange rates and US/EA trade shares are not reported to save space.

Regression results for RMB invoicing by region

| | Exports | | | | Imports | | | |
|--------------------------------------|---------------------|---------------------|---------------------|------------------|----------------------|----------------------|----------------------|--------------------|
| | (1) USD | (2) EUR | (3) Other | (4) RMB | (5) USD | (6) EUR | (7) Other | (8) RMB |
| Share of X/M to/from CH in total X/M | | | | | | | | |
| x S-E/E Asia dummy | 0.24*** (0.00) | -0.34*** (0.00) | 0.10 (0.11) | -0.03 (0.28) | 0.73*** (0.00) | -0.28*** (0.00) | -0.45*** (0.00) | 0.10*** (0.00) |
| x Europe dummy | 1.13** (0.03) | -0.56* (0.07) | -0.62** (0.01) | -0.03 (0.10) | -0.37** (0.01) | 0.69*** (0.00) | -0.32*** (0.00) | -0.05*** (0.00) |
| x Latin America dummy | 0.14** (0.02) | -0.11** (0.02) | -0.02 (0.69) | -0.00 (0.47) | 0.34 (0.11) | -0.42*** (0.00) | 0.08 (0.69) | -0.02 (0.11) |
| x Oceania dummy | 0.25** (0.02) | -0.14*** (0.00) | -0.11 (0.24) | 0.12** (0.02) | 0.71 (0.24) | -0.13 (0.52) | -0.74 (0.33) | 0.12*** (0.00) |
| x Sub-Saharan Africa dummy | 0.05 (0.43) | 0.09* (0.07) | -0.14** (0.02) | 0.01 (0.11) | -0.11 (0.54) | 0.04 (0.74) | 0.07 (0.71) | 0.01 (0.57) |
| x Other region dummy | -0.41* (0.06) | 0.22 (0.29) | 0.28* (0.07) | 0.01 (0.61) | -0.17 (0.13) | -0.03 (0.66) | 0.20 (0.11) | -0.05** (0.02) |
| Within R-squared | 0.21 | 0.23 | 0.11 | 0.35 | 0.30 | 0.37 | 0.13 | 0.37 |
| Observations | 575 | 580 | 579 | 214 | 626 | 621 | 621 | 259 |
| Countries | 85 | 84 | 84 | 38 | 94 | 93 | 93 | 48 |
| Countries in groups | 9/35/10/ 3/11/17 | 9/35/10/ 3/11/16 | 9/35/10/ 3/11/16 | 8/5/8/ 2/6/9 | 10/38/11/ 4/13/18 | 10/38/11/ 3/13/18 | 10/38/11/ 3/13/18 | 10/8/7/ 2/9/12 |

Results for RMB invoicing: Summary

- Strengthening trade ties with CHN in general associated with
 - ▶ greater USD invoicing
 - ▶ at the expense of the EUR
- RMB invoicing has picked up only for some regions and trade flows, namely
 - ▶ SE/E Asian and Oceanian countries
 - ▶ imports
- Increasing RMB invoicing at the expense of the 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'

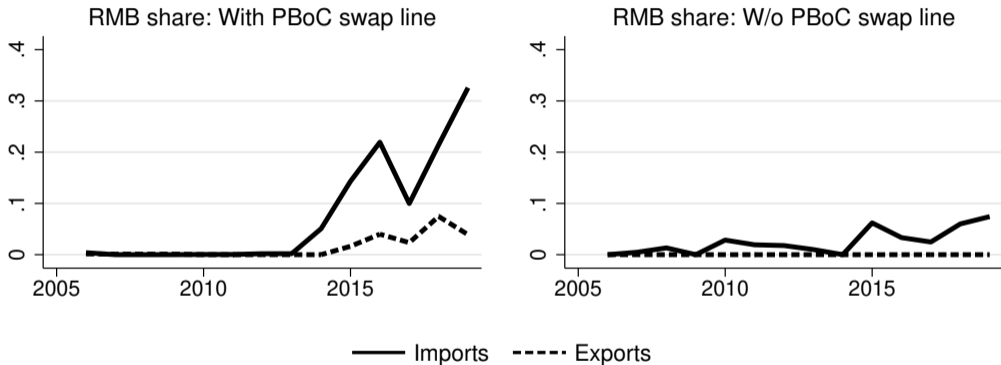
- RMB internationalisation
- Stylised facts on RMB invoicing
- Regression results
 - Strengthening trade ties with CHN
 - PBoC swap lines

3 Conclusion

PBoC swap lines and RMB invoicing

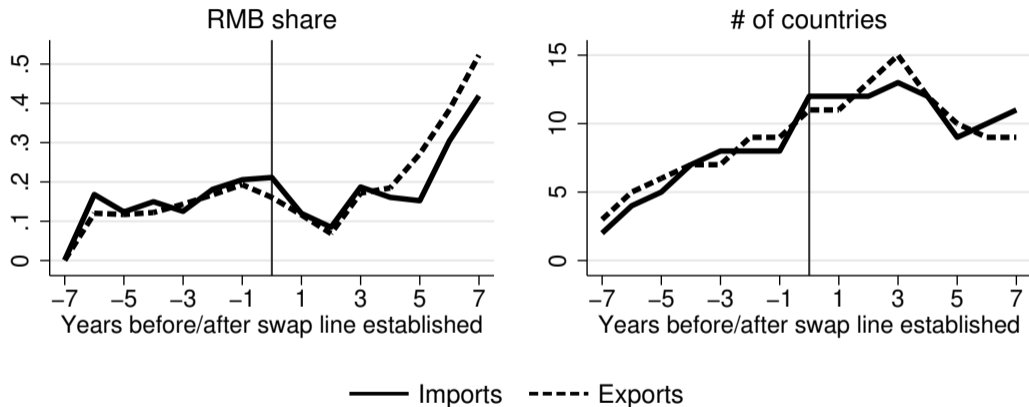
- PBoC has signed 40+ swap agreements with other central banks
Direction Générale du Trésor (2018) as well as Bahaj and Reis (2020)
- Stated objective: Facilitate RMB trade settlement
People's Bank of China (2012)
- Theory suggests swap lines may render RMB trade finance more stable/reliable
Bahaj and 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.

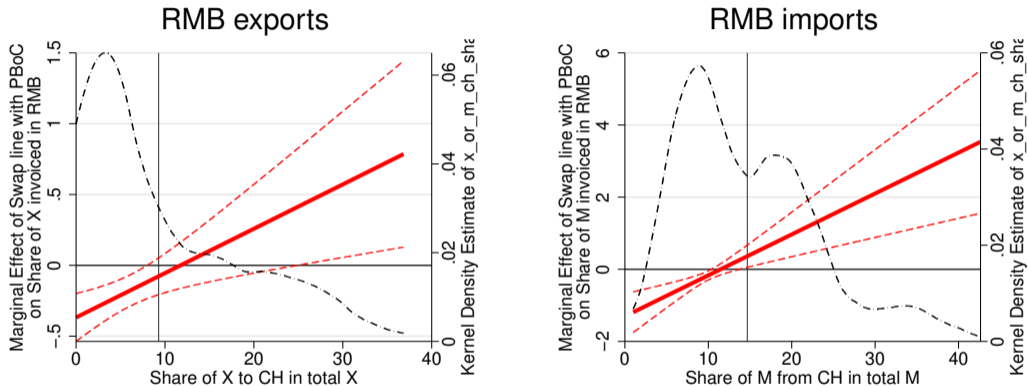
Regressions for PBoC swap lines and RMB invoicing

- Run regressions

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

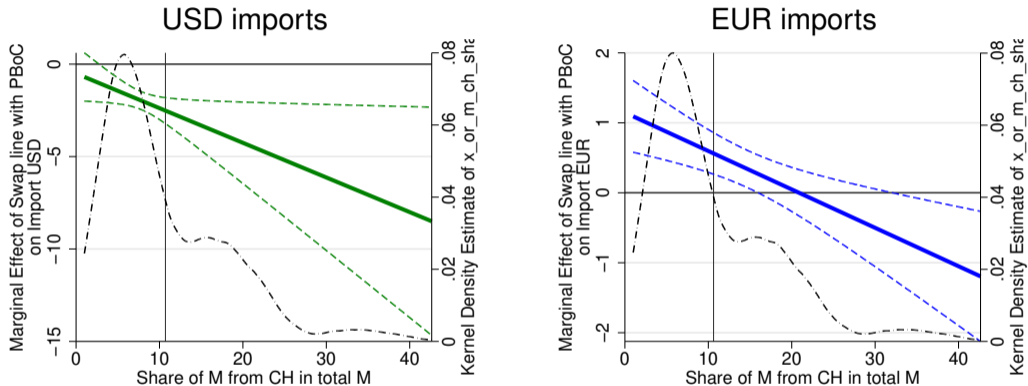
- ▶ $S_{i,t}^{k,\ell}$: Share of country i 's trade flow $k \in \{x, m\}$ invoiced in currency $\ell \in \{\$, \€, \¥\}$
 - ▶ $PBoCSwap_{i,t}$: PBoC swap line dummy
 - ▶ $\omega_{i,t}^{k,CHN}$: Share of exports/imports accounted for by CHN
- Start regressions already in **2008** when first swap line 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

Regression results for PBoC swap lines and RMB 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.

Regression results for PBoC swap lines and USD/EUR 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.

Results for PBoC swap lines and RMB invoicing: Summary

- PBoC swap lines in general associated with **greater RMB invoicing** for countries with strong trade ties with CHN
- RMB invoicing associated with PBoC swap lines **at the expense of both EUR and USD**

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 share in global trade have held up EUR invoicing and limited USD dominance
 - ▶ Will European integration deepen further, stall or recede?
- RMB vs. USD/EUR: 'Policies'
 - ▶ Strengthening trade ties with CHN already associated with increasing RMB invoicing, albeit from very low levels, only in selected regions and trade flows
 - ▶ Establishment of PBoC swap lines associated with rising RMB invoicing
 - ▶ RMB invoicing mostly at the expense of the EUR
 - ▶ Will the RMB also challenge the USD?

- Asian Development Bank, 2019. Asian Economic Integration Report. Asian Development Bank, Manila.
- Bacchetta, P., van Wincoop, E., 2005. A Theory of the Currency Denomination of International Trade. *Journal of International Economics* 67, 295–319.
- Bahaj, S., Reis, R., 2020. Jumpstarting an International Currency. CEPR Discussion Paper 14793.
- Belotti, F., Borin, A., Mancini, M., 2020. *icio* : Economic Analysis with Inter-Country Input-Output Tables in Stata. World Bank Policy Research Working Paper 9156.
- Boz, E., Casas, C., Georgiadis, G., Gopinath, G., Le Mezo, H., Mehl, A., Nguyen, T., 2020. Invoicing Currency Patterns in Global Trade. IMF Working Paper 20/126.
- Caballero, R., Farhi, E., Gourinchas, P.O., 2008. An Equilibrium Model of “Global Imbalances” and Low Interest Rates. *American Economic Review* 98, 358–93.
- Central Bank of Egypt, 2017. The Treatment of Currency Swaps between Central Banks: Egypt Experience. Thirteenth Meeting of the IMF Committee on Balance of Payments Statistics, Paris.
- Chen, X., Cheung, Y., 2011. Renminbi Going Global. *China & World Economy* 19, 1–18.
- Chinn, M., Frankel, J., 2008. Why the Euro Will Rival the Dollar. *International Finance* 11, 49–73.
- Devereux, M., Engel, C., Storgaard, P., 2004. Endogenous Exchange Rate Pass-through When Nominal Prices Are Set in Advance. *Journal of International Economics* 63, 263–291.
- Devereux, M., Shi, S., 2013. Vehicle Currency. *International Economic Review* 54, 97–133.
- Direction Générale du Trésor, 2018. The Global Network of Central Bank Swap Lines. *Trésor-economics* 231.
- Eichengreen, B., 2011. The Renminbi As an International Currency. *Journal of Policy Modeling* 33, 723–730.
- Eichengreen, B., Lombardi, D., 2017. RMBI or RMBR? Is the Renminbi Destined to Become a Global or Regional Currency? *Asian Economic Papers* 16, 35–59.
- European Central Bank, 2018. The International Role of the Euro. European Central Bank, Frankfurt.
- European Commission, 2018. Towards a Stronger International Role of the Euro. European Commission contribution to the European Council and the Euro Summit, Brussels.
- Frankel, J., 2012. Internationalization of the RMB and Historical Precedents. *Journal of Economic Integration* 27, 329–365.
- Friberg, R., Wilander, F., 2008. The Currency Denomination of Exports — A Questionnaire Study. *Journal of International Economics* 75, 54–69.
- Garcia-Herrero, A., Xia, L., 2015. RMB Bilateral Swap Agreements: How China Chooses its Partners? *Asia-Pacific Journal of Accounting & Economics* 22, 368–383.
- Goldberg, L., Tille, C., 2008. Vehicle-currency Use in International Trade. *Journal of International Economics* 76, 177–192.
- Goldberg, L., Tille, C., 2013. A Bargaining Theory of Trade Invoicing and Pricing. NBER Working Papers 18985.
- Gopinath, G., 2015. The International Price System. NBER Working Paper 21646.
- Gopinath, G., Itskhoki, O., Rigobon, R., 2010. Currency Choice and Exchange Rate Pass-Through. *American Economic Review* 100, 304–336.

- Gopinath, G., Stein, J., 2018. Banking, Trade, and the Making of a Dominant Currency. NBER Working Paper 24485.
- Gourinchas, P.O., 2019. The Dollar Hegemon? Evidence and Implications for Policy Makers. Prepared for the 6th Asian Monetary Policy Forum to be held in Singapore on 31 May 2019 .
- Gourinchas, P.O., Rey, H., 2013. External Adjustment, Global Imbalances and Valuation Effects. NBER Working Paper 19240.
- Hallak, J., Schott, P., 2011. Estimating Cross-Country Differences in Product Quality. *The Quarterly Journal of Economics* 126, 417–474.
- Hummels, D., Ishii, J., Yi, K.M., 2001. The Nature and Growth of Vertical Specialization in World Trade. *Journal of International Economics* 54, 75–96.
- Ito, H., Chinn, M., 2014. The Rise of the “Redback” and the People’s Republic of China’s Capital Account Liberalization: An Empirical Analysis of the Determinants of Invoicing Currencies. ADBI Working Paper 473.
- Ito, H., Kawai, M., 2016. Trade Invoicing in Major Currencies in the 1970s-1990s: Lessons for Renminbi Internationalization. *Journal of the Japanese and International Economies* 42, 123–145.
- Kamps, A., 2006. The Euro as Invoicing Currency in International Trade. ECB Working Paper 665.
- Lafarguette, R., 2015. Update of Kamps (2006). mimeo.
- Lapukeni, A., Kiyotaka, S., 2019. Invoice Currency Choice in Malawi’s Imports from Asia: Is there any evidence of Renminbi Internationalization? RIETI Discussion Paper 19060.
- Lenzen, M., Moran, D., Kanemoto, K., Geschke, A., 2013. Building EORA: A Global Multi-Region Input-Output Database At High Country And Sector Resolution. *Economic Systems Research* 25, 20–49.
- Liao, S., McDowell, D., 2015. Redback Rising: China’s Bilateral Swap Agreements and Renminbi Internationalization. *International Studies Quarterly* 59, 401–422.
- Lin, Z., Zhan, W., Cheung, Y.W., 2016. China’s Bilateral Currency Swap Lines. *China & World Economy* 24, 19–42.
- McDowell, D., 2019. The (Ineffective) Financial Statecraft of China’s Bilateral Swap Agreements. *Development and Change* 50, 122–143.
- Miranda-Agrippino, S., Rey, H., 2020. US Monetary Policy and the Global Financial Cycle. *Review of Economic Studies* .
- Mukhin, D., 2018. An Equilibrium Model of the International Price System. mimeo .
- Murray, J., Powell, J., 2002. Dollarization in Canada: The Buck Stops There. Bank of Canada Technical Report 90.
- Novy, D., 2006. Hedge Your Costs: Exchange Rate Risk and Endogenous Currency Invoicing. Warwick Economics Research Paper 765.
- Panetta, F., 2020. Sharing and Strengthening the Euro’s Privilege. The ECB Blog.
- People’s Bank of China, 2011. The PBoC Annual Report 2010. People’s Bank of China, Beijing.
- People’s Bank of China, 2012. The PBoC Annual Report 2011. People’s Bank of China, Beijing.
- People’s Bank of China, 2015. The Report of RMB Internationalisation. People’s Bank of China, Beijing.
- Prasad, E., 2016. *Gaining Currency: The Rise of the Renminbi*. Oxford University Press.
- Rauch, J., 1999. Networks Versus Markets in International Trade. *Journal of International Economics* 48, 7–35.
- Rey, H., 2001. International Trade and Currency Exchange. *Review of Economic Studies* 68, 443–464.
- Song, K., Xia, L., 2019. Bilateral Swap Agreement and Renminbi Settlement in Cross-border Trade. BOFIT Discussion Paper 19/2019.
- Timmer, M., Dietzenbacher, E., Los, B., Stehrer, R., Vries, G., 2015. An Illustrated User Guide to the World Input–Output Database: The Case of Global Automotive Production. *Review of International Economics* 23, 575–605