# Exorbitant privilege and economic sanctions

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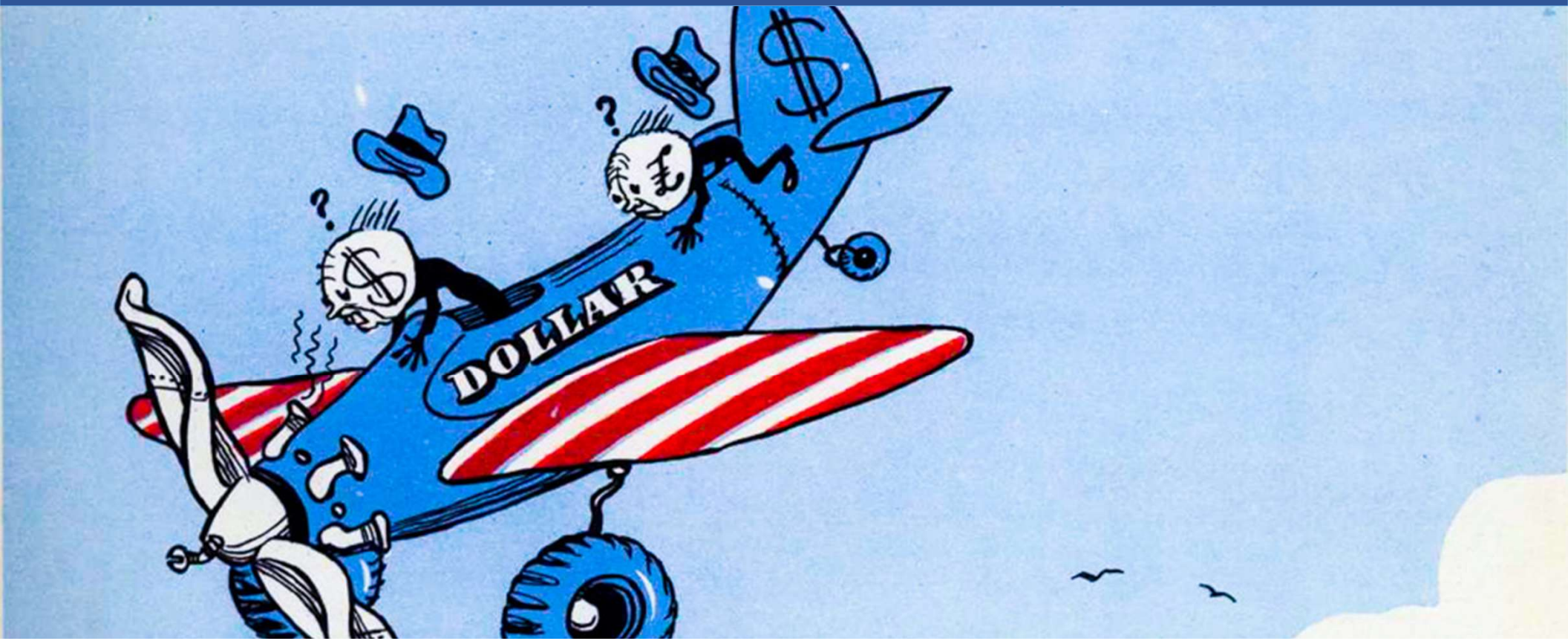
European Bank
for Reconstruction and Development



# Motivation

Economic sanctions have been proliferating, but do we really understand all of their implications? Are there some unintended consequences of sanctions?

Small, but growing literature, has typically looked at their implications for trade, but what about implications for the choice of currency used to invoice international trade?

Could sanctions undermine the dominance of traditional vehicle currencies by helping launch a new international currency?

For an importer (exporter), dealing in multiple currencies is costly

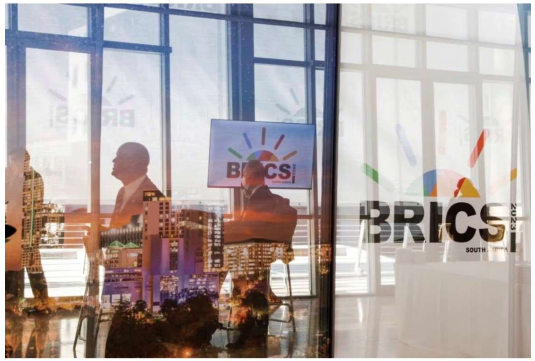
- Are sanctions a large enough shock to induce diversification and switching?

# Sanctions on Russia have given rise to talk about BRICS currency

## What is a BRICS currency and is the U.S. dollar in trouble?

By **Rachel Savage**

August 24, 2023 11:02 AM GMT+1 · Updated 3 months ago




Delegates walk past the logos of the BRICS summit during the 2023 BRICS Summit at the Sandton Convention Centre in Johannesburg, ...Africa on August 23, 2023. GIANLUIGI GUERCIA/Pool via...

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The rise of the middle powers

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## China capitalises on US sanctions in fight to dethrone dollar

Beijing uses developing world chagrin over Washington's weaponisation of greenback to push global renminbi

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## The power and the limits of the American dollar

The greenback is still king. But those who want to evade it are finding ways to do so

IMAGE: GETTY IMAGES

Apr 27th 2023

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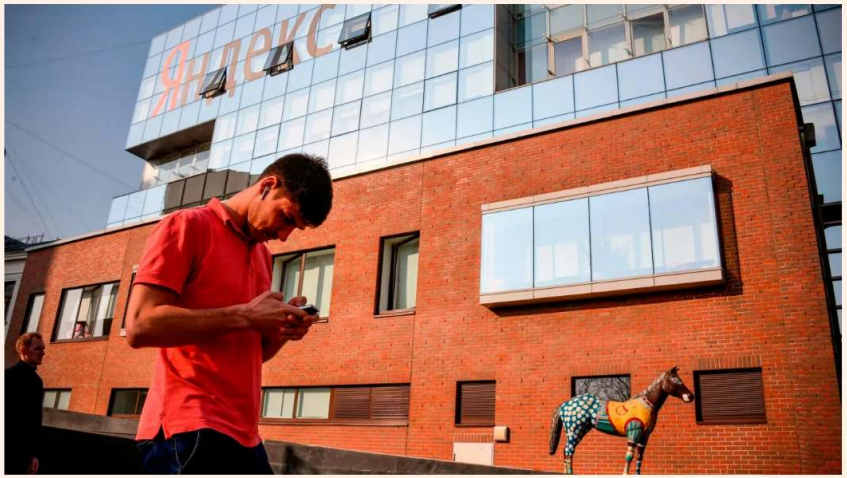
VERY SO OFTEN an appetite surges for

# CNY is also reported to be increasingly used in transactions involving divestment of asset holdings in Russia

## Search engine Yandex to sell Russian operations for $5bn

Sale of 'Russia's Google' is largest by a western-held company seeking to exit the country since Ukraine war began



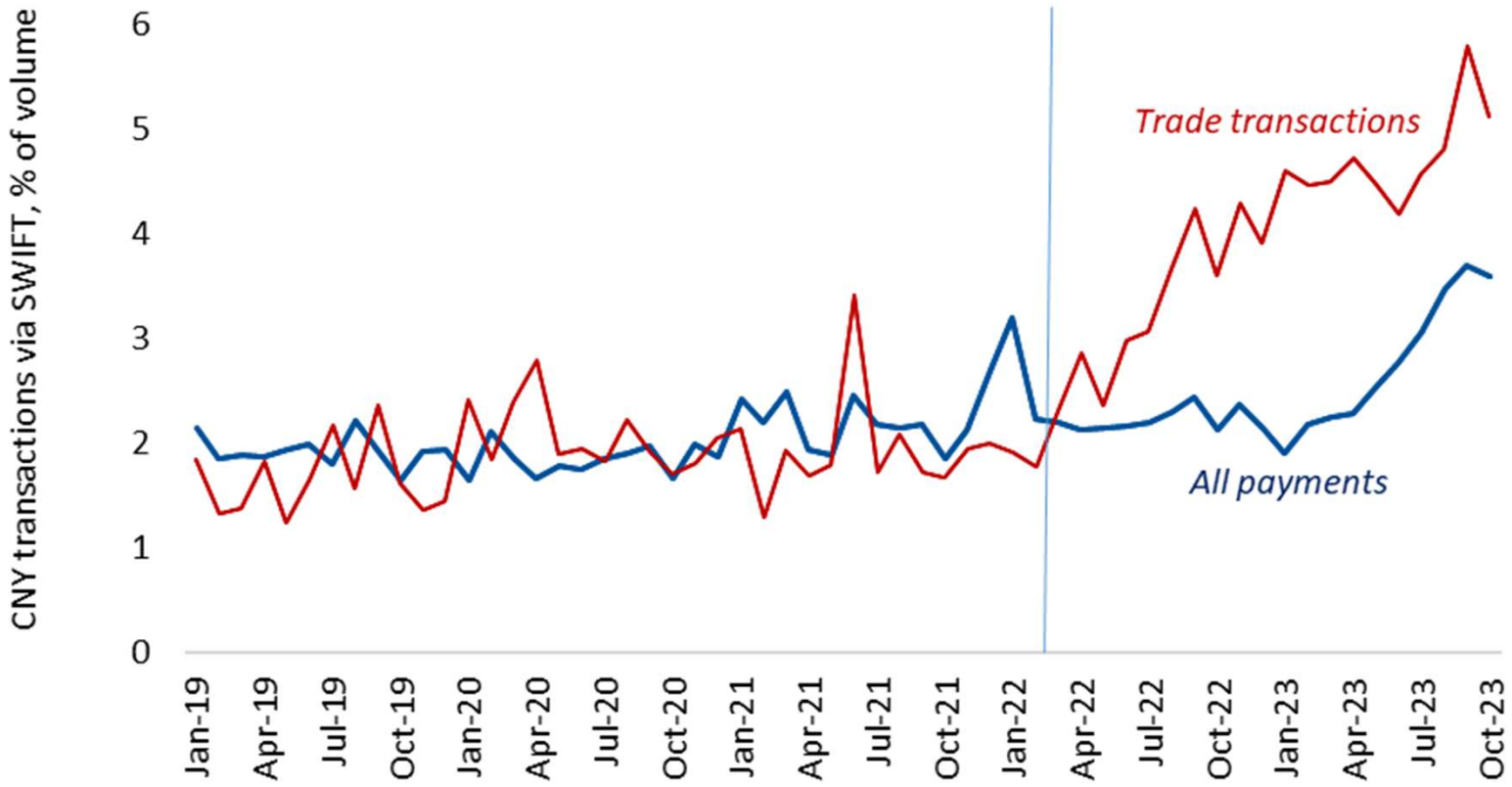

Yandex's Russian business will be owned by a consortium including members of the company's management and oil major Lukoil © Alexander Nemenov/AFP/Getty Images

The first part of the deal, set to close in the first half of 2024, envisions Yandex's parent selling 68 per cent of the Russian business for the cash equivalent of Rbs230bn and up to 67.8mn shares in the Dutch company.

"The cash consideration will be paid in Chinese Yuan outside of Russia," Yandex said.

Source: Financial Times 5 February 2024.

# CNY payments on the rise as a share of global SWIFT transactions since early 2022 – in particular for trade related payments




Source: SWIFT and authors' calculations.

# This paper

Research question:

**Have sanctions affected the choice of currency used to denominate exports to a sanctioned country?**

Context: Western sanctions imposed in the aftermath of Russia's invasion of Ukraine

- Trade sanctions, financial sanctions with major banks disconnected from SWIFT, part of Central Bank reserves frozen
- This episode stands out in terms of its size, comprehensive nature and the size of the target economy (11$^{th}$ largest economy in 2021 at market exchange rates)

Data: Transaction-level data on Russia's imports 2016-2022

# Preview of the findings: Aggregate and firm-level evidence

The **share of Russia's imports invoiced in yuan (CNY) increased by 17% points;** CNY up 5pp among vehicle currencies

Number of importing **firms in Russia dealing with CNY increased sharply**, numbers dealing with USD and EUR dropped

97%+ importers work in a single currency for product * country. In 2022, 4% diversified from 1 to 2+ currencies. Dominant move: USD vehicle → CNY producer / vehicle

*Channels?* **Financial infrastructure + stance on sanctions: Use of CNY as a vehicle currency increased by 4% points** for trading partners that have an active PBOC **swap line and did not impose economic sanctions** on Russia

Concern about secondary sanctions: CNY share increased more for trade in (internationally) **sanctioned dual-use** (and **industrial) goods** and for **intermediated trade** (sanctioning origin or Western trademarks), controlling for importing firm-products

**Higher compliance-driven fixed costs of trading in USD:** Switching to CNY away from USD for smaller transactions, smaller firms

**Hedging** / utilizing CNY receipts by exporters? No evidence

*So what?* USD dominance boosts sanction effectiveness – but sanctions may undermine USD dominance over time

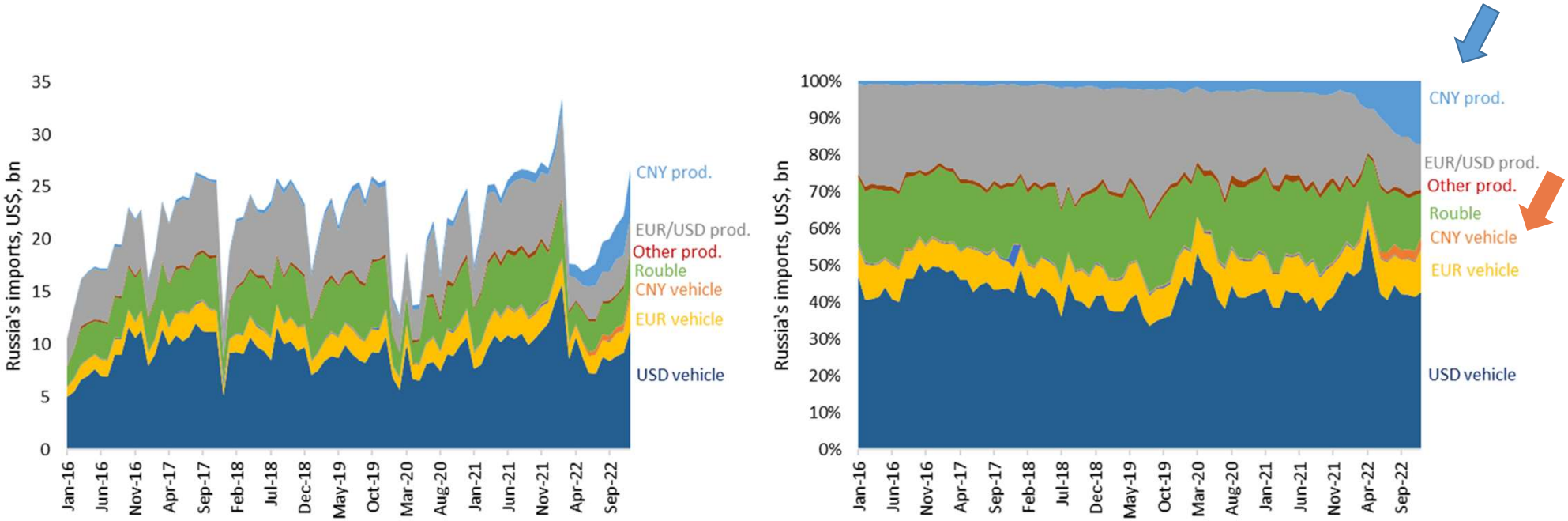
# Literature

Choice of invoicing currency, e.g., Goldberg and Tille (2008), Gopinath et al. (2010), Berthou (2023), Corsetti et al. (2023)

Rise of international currencies, e.g., Clayton et al. (2022), Bahaj and Reis (2020)

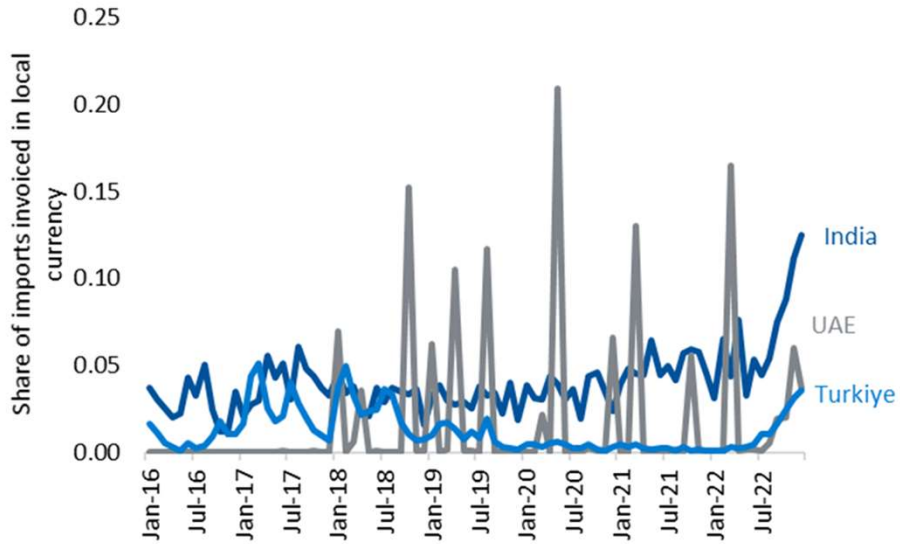
Effectiveness of economic sanctions, e.g., Crozet and Hinz (2020, 2021), Tyazhelnikov et al. (2023), Yang et al. (2009), Chupilkin et al. (2023ab), Babina et al. (2023), Efing et al. (2023), Besedes et al. (2017), Fisman et al. (2024)

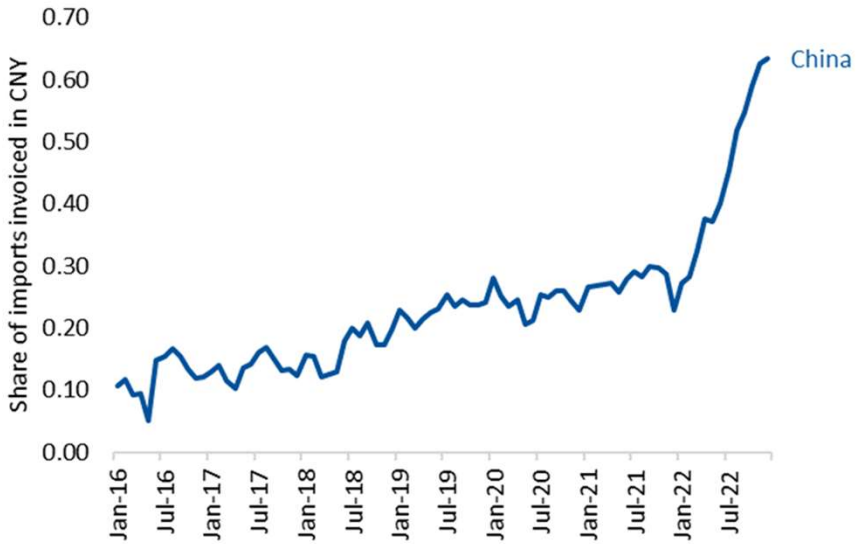
# Rapid rise of CNY as producer & vehicle currency after imposition of sanctions




Source: Russia customs statistics and authors' calculations.

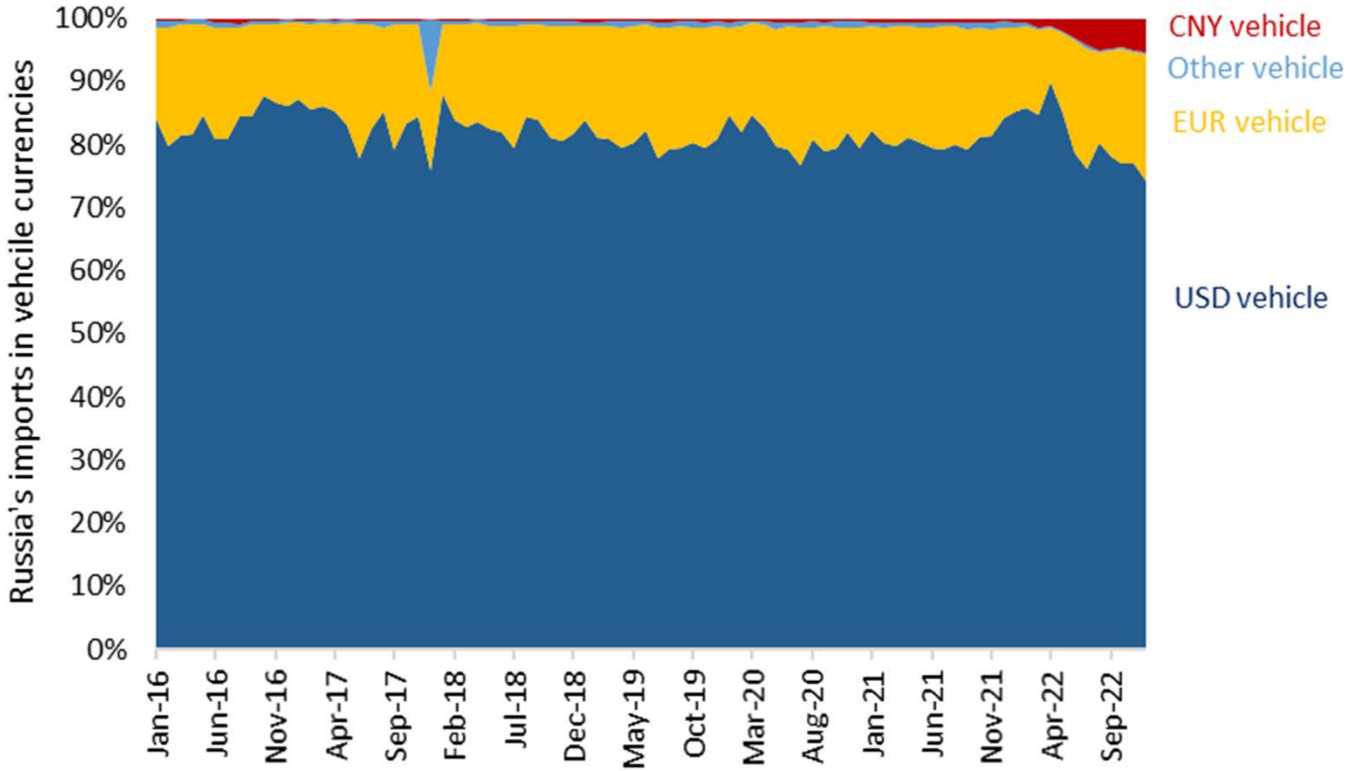
# Increased use of other producer currencies -- in imports from India, Turkiye, UAE – from a low base



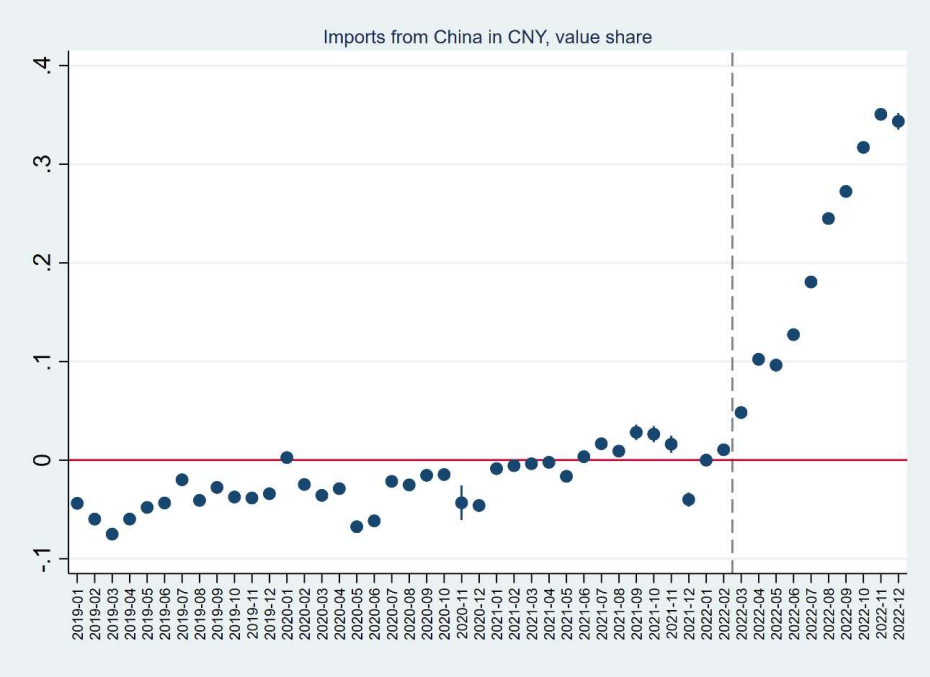

Source: Russia customs statistics and authors' calculations.

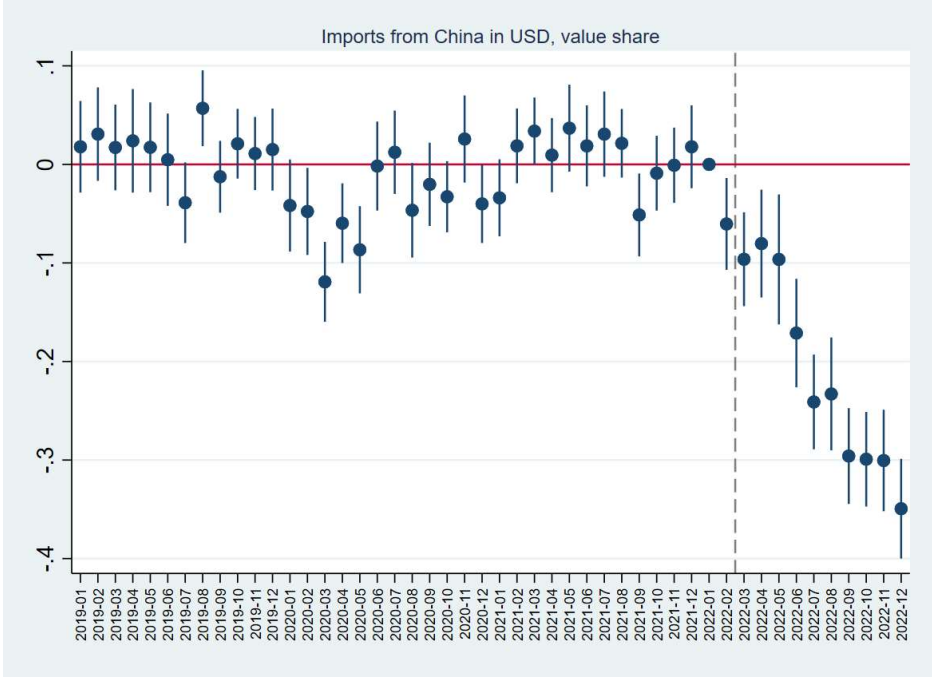
# CNY as a vehicle currency up from <1% to 5%+ by end-2022 (as a share of imports in vehicle currencies)




Source: Russia customs statistics and authors' calculations.

# *Event study:* CNY invoicing gradually increasing between Mar and Nov 2022 in China-Russia trade while USD gradually down



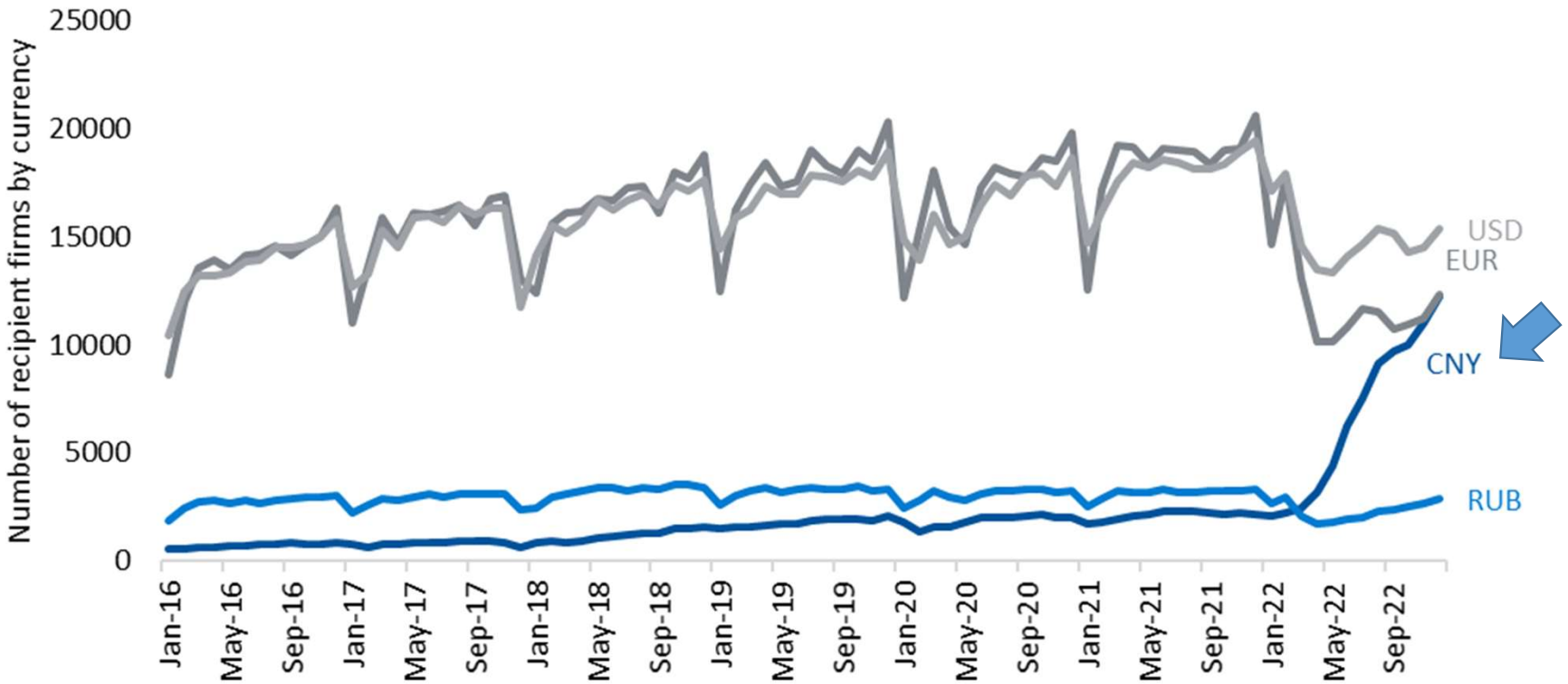

Source: Russia customs statistics and authors' calculations. Regression coefficients where currency share in imports from China are interacted with dummy variables for each month. Left panel: dependent variable = share in producer currency; right panel dependent variable = share of USD in bilateral trade in a given month. Standard errors are clustered two-way on countries and months.

# Broad-based shifts: Share of firms using CNY as a vehicle currency up 2X, CNY as producer currency up 5X, also increases in terms of transaction records

| | CNY producer | CNY vehicle | EUR vehicle | EUR/USD prod. | RUB | USD vehicle | Other |
|---|---|---|---|---|---|---|---|
| | | | | **March-December 2021** | | | |
| Import value | 3.0 | 0.5 | 9.6 | 22.5 | 21.4 | 41.0 | 2.0 |
| Transactions | 2.6 | 0.3 | 10.9 | 29.0 | 28.9 | 25.7 | 2.5 |
| Firms | 4.4 | 1.4 | 20.4 | 29.1 | 6.0 | 34.4 | 4.4 |
| | | | | **March-December 2022** | | | |
| Import value | 13.0 | 2.2 | 9.1 | 14.0 | 16.2 | 44.2 | 1.3 |
| Transactions | 13.6 | 1.7 | 12.4 | 20.3 | 9.7 | 39.9 | 2.3 |
| Firms | 20.7 | 3.1 | 14.5 | 18.5 | 6.7 | 33.2 | 3.4 |

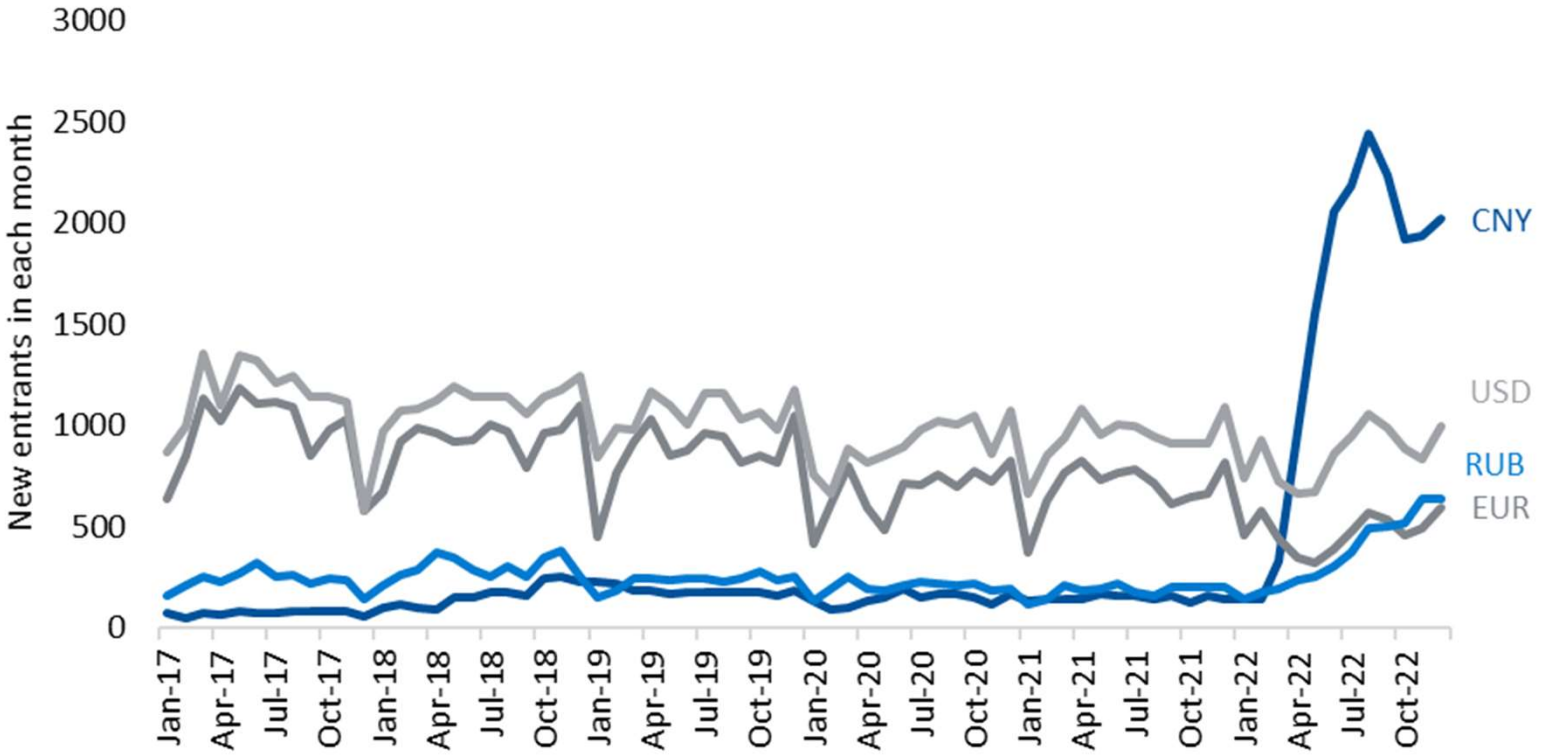
Source: Russia customs statistics and authors' calculations.

# Sharp increase in number of firms dealing with CNY invoices and a drop in numbers dealing with USD and EUR invoicing




Source: Russia customs statistics and authors' calculations. Firms tracked using unique tax identifiers of importers.

# Many new entrants deal with CNY invoices high turnover of firms dealing with rouble invoicing (entries and exits)




Source: Russia customs statistics and authors' calculations. Entry rate into the business of dealing with invoicing in a given currency, in % of firms active in that line of business over the preceding 12 months. Firms tracked using unique tax identifiers of importers.

# For a given product X country, most importers work in a single currency (97%)
# In 2022, around 4% diversified from 1 to 2 currencies

% of trade where importing firms deal with 1, 2, 3 or 4+ currencies of invoicing, as % of import value, transaction records and firms

## By firm

| Number of currencies | 1 | 2 | 3 | >3 |
|---|---|---|---|---|
| **March-December 2021** | | | | |
| Import value | 21.1 | 23.1 | 21.4 | 34.3 |
| Transactions | 25.5 | 28.2 | 21.7 | 24.6 |
| Firms | 72.9 | 20.9 | 4.8 | 1.4 |
| **March-December 2022** | | | | |
| Import value | 22.4 | 25.3 | 23.4 | 29.0 |
| Transactions | 32.8 | 29.9 | 19.1 | 18.2 |
| Firms | 64.8 | 24.4 | 8.4 | 2.3 |

## By firm X product X country

| Number of currencies | 1 | 2 | 3 | >3 |
|---|---|---|---|---|
| **March-December 2021** | | | | |
| Import value | 77.9 | 13.0 | 1.1 | 8.1 |
| Transactions | 86.8 | 12.0 | 0.9 | 0.3 |
| Firms | 97.2 | 2.7 | 0.1 | 0.0 |
| **March-December 2022** | | | | |
| Import value | 78.9 | 19.6 | 1.4 | 0.1 |
| Transactions | 79.5 | 17.4 | 2.9 | 0.2 |
| Firms | 93.2 | 6.6 | 0.2 | 0.0 |

Source: Russia customs statistics and authors' calculations.

# The dominant move: USD vehicle to CNY producer or CNY vehicle; also RUB to EUR

Transition matrix based on firm-product-country where firms are dealing with a single currency in Mar-Dec 2021, by probability of dealing with a given single currency in Mar-Dec 2022

| | | March-December 2022 | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | CNY producer | CNY vehicle | USD vehicle | EUR vehicle | EUR/USD prod. | Other | RUB |
| Mar-Dec 2021 | CNY producer | 97.8 | 0.0 | 1.9 | 0.1 | 0.0 | 0.0 | 0.2 |
| | CNY vehicle | 0.0 | 94.1 | 5.5 | 0.1 | 0.2 | 0.0 | 0.1 |
| | USD vehicle | 11.1 | 1.4 | 85.8 | 0.6 | 0.3 | 0.4 | 0.4 |
| | EUR vehicle | 1.0 | 0.8 | 3.1 | 93.6 | 0.1 | 0.6 | 0.7 |
| | EUR/USD producer | 0.0 | 0.0 | 0.5 | 0.0 | 99.4 | 0.0 | 0.1 |
| | Other | 0.1 | 0.3 | 3.3 | 4.0 | 0.3 | 91.8 | 0.2 |
| | RUB | 1.0 | 0.3 | 2.4 | 2.8 | 8.5 | 0.2 | 84.7 |

Comparing firm-product-country cells that relied on a single currency in Mar-Dec'21 and in Mar-Dec'22

Source: Russia customs statistics and authors' calculations.

# Firm-level analysis to shed light on mechanisms

**Financial infrastructure (eg swap lines)** may be important, countries' attitude to sanctions: compare countries

Concern about secondary sanctions: Compare **sanctioned products** vs other products; trade that is linked to sanctioning countries (origin, trademark) but going through neutral **intermediaries**

**Higher compliance-driven fixed costs of trading in USD?** Compare different firms, transactions of different sizes

**Hedging** / utilizing CNY receipts by exporters? Look at firms that both export and import

Look at CNY prod / vehicle, USD vehicle, EUR vehicle, other producer currencies, RUB

# Looking at the currency shares in total bilateral trade in a given month for a given product group and importer firm

$$CurrencyShare_{fpit} = \beta_1 \, PostSanctions_t x \, Characteristic \quad + \alpha_{fixed\,effects} + \varepsilon_{fpit}$$

- Robustness checks looking at shares by number of transactions
- Robustness also looking at aggregated view (shifts within and across firms): country*month or product*country*month

**Monthly** aggregation Jan 2016 - Dec 2022; ***PostSanctions*** = 1 from March 2022, 0 otherwise

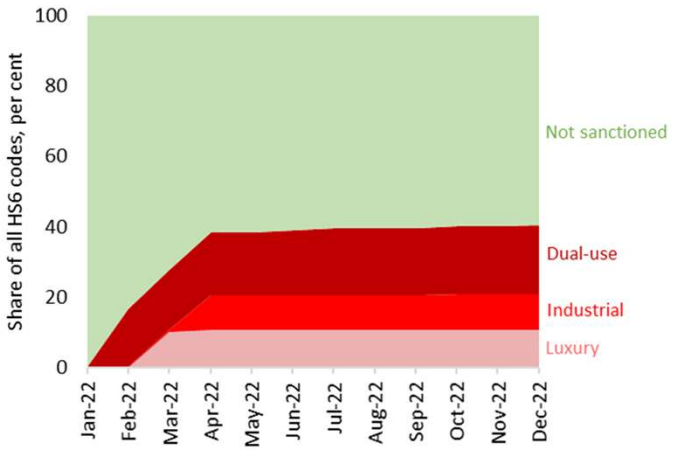
**Exporter types:**

- **Sanctioning countries** (45 countries including the EEA, US, UK)
- **Neutral countries** (China, Serbia, Turkiye, UAE)
- China, the largest trading partner post-sanctions

**Product types** based on EU sanctions lists (Chupilkin et al., 2023):

- Dual-use
- Industrial goods
- Luxury goods
- Other

**Share of sanctioned HS6 codes by month**



# Producer currencies, CNY as vehicle more likely to be used in trade with neutral economies (same products, firms) at the expense of USD, EUR

$$CurrencyShare_{fpit} = \beta_1 PostSanctions_t x\ CountryGroup_i + \alpha_{fpt} + \alpha_{fpi} + \varepsilon_{fpit}$$

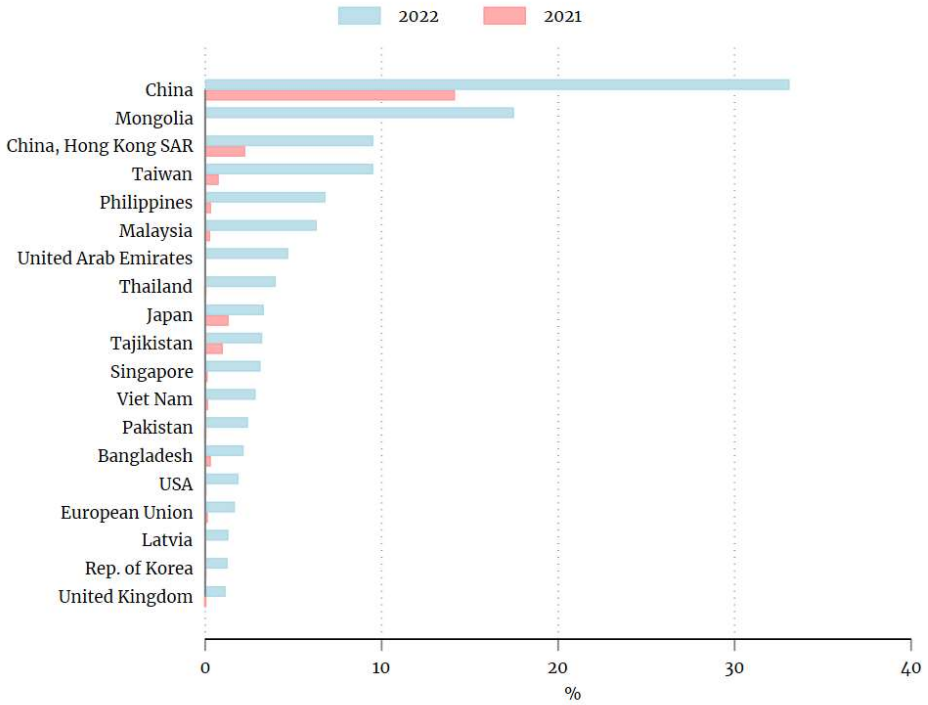
Firm * product * month and firm * product * country fixed effects

| VARIABLES | CNY | USD vehicle | EUR vehicle | Producer | RUB |
|---|---|---|---|---|---|
| Post-sanctions x China | **0.164*** ** | **-0.157*** ** | **-0.00681*** ** | **0.192*** ** | **0.0102*** ** |
| | (0.00441) | (0.00455) | (0.00258) | (0.00423) | (0.00137) |
| Post-sanctions x Neutral | **0.0321*** ** | **-0.0346*** ** | **-0.0112*** ** | **0.00853*** ** | **0.00775*** ** |
| | (0.00274) | (0.00396) | (0.00335) | (0.00183) | (0.00150) |
| Observations | 5,191,160 | 4,739,909 | 2,011,381 | 5,191,160 | 5,191,160 |
| R-squared | 0.893 | 0.964 | 0.969 | 0.925 | 0.968 |

Source: Russia customs statistics and authors' calculations. ***, **, * denote statistical significance at the 1%. 5%, 10% levels. Standard errors are clustered on product groups. Base group: Sanctioning economies.

# Most economies increasingly using CNY invoices have currency swap lines with People's Bank of China

Top 20 countries by increase in share of invoicing Russian imports in CNY between 2021 and 2022




Note: Countries with at least 1 mln USD of imports invoiced in CNY in 2022

**Table A1:** CNY swap lines

| Country | Date | Amount | Country | Date | Amount |
|---|---|---|---|---|---|
| Hong Kong SAR | 20.1.2009 | 200-500 | South Korea | 20.4.2009 | 180-400 |
| Malaysia | 8.02.2009 | 80-180 | Belarus | 11.03.2009 | 7-20 |
| Indonesia | 23.03.2009 | 100-250 | Argentina | 2.04.2009 | 70-130 |
| Iceland | 9.06.2010 | 3.5 | Singapore | 23.07.2010 | 150-300 |
| New Zealand | 18.04.2011 | 25 | Uzbekistan | 19.04.2011-19.04.2014 | 0.7 |
| Mongolia | 6.05.2011 | 5-15 | Kazakhstan | 13.06.2011 | 7 |
| Thailand | 22.12.2011 | 70 | Pakistan | 23.12.2011 | 10-30 |
| UAE | 17.01.2012-14.12.2018 | 35 | Turkiye | 21.2.2012 | 10-35 |
| Australia | 22.3.2012 | 200 | Ukraine | 26.06.2012-10.12.2021 | 15 |
| Brazil | 26.03.2013-26.03-2016 | 190 | UK | 22.06.2013 | 350 |
| Hungary | 09.09.2013 | 10-40 | Albania | 12.09.2013 | 2 |
| ECB | 08.10.2023 | 350 | Switzerland | 21.07.2-14-21.07.2020 | 350 |
| Sri Lanka | 16.09.2014 | 10 | Russia | 13.10.2014 | 150 |
| Qatar | 3.11.2014 | 35 | Canada | 8.11.2014 | 200 |
| Suriname | 18.03.2015 | 1 | Armenia | 25.03.2015-25.03.2018 | 1 |
| South Africa | 10.04.2015 | 30 | Chile | 25.05.2015 | 22-50 |
| Tajikistan | 3.09.2015-3.09.2018 | 3 | Morocco | 11.05.2016-11.05.2019 | 10 |
| Serbia | 17.06.2016-17.06.2019 | 1.5 | Egypt | 6.12.2016 | 18 |
| Nigeria | 3.05.2018 | 15 | Japan | 26.10.2018 | 200 |
| Macau SAR | 05.12.2019 | 30 | Laos | 20.05.2020 | 6 |

*Source*: Authors based on Bahaj and Reis (2020) and People's Bank of China.
*Note*: As of end-2022; amounts in CNY billion. If end date is not specified, the line is ongoing.

Source: Russia customs statistics and authors' calculations.

# Swap line is associated with extra 2-4% CNY invoicing share post sanctions – only for neutral countries

$$CurrencyShare_{fpit} = \beta_1 PostSanctions_t x\ SwapLine_{it}\ x\ Sanctioning_i + \beta_2 PostSanctions_t x\ SwapLine_{it} + \beta_3 PostSanctions_t * Sanctioning_i + \beta_4\ SwapLine_{it}\ x\ Sanctioning_i + \beta_5\ SwapLine_{it} + \alpha_{fpt} + \alpha_{fpi} + \varepsilon_{fpit}$$ firm * product * month and firm * product * country FE

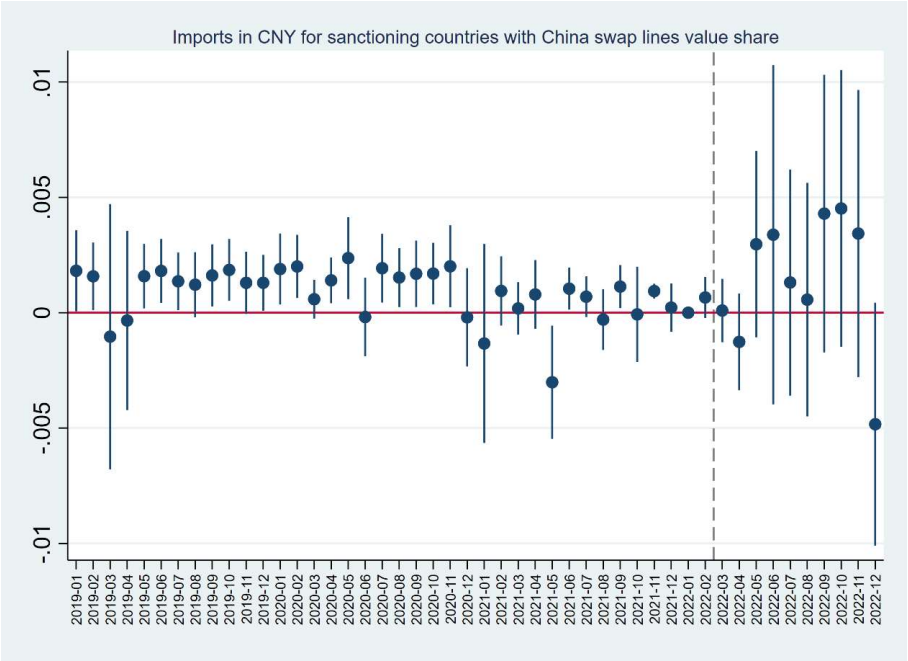
Alternatively, aggregate by country * month with country and month fixed effects (to account for within-firm shifts and turnover of importers)

| Dep.var: Trade invoiced in CNY | Swap lines | | Swap lines and sanctioning vs neutral | | |
|---|---|---|---|---|---|
| | Share of volume | Share of transactions | Share of volume | Share of transactions | Share of volume, aggregated cells |
| Post-sanctions x Swap line | **0.00649*** ** | **0.00435** ** | **0.0225*** ** | **0.0155*** ** | **0.0453*** ** |
| | (0.00169) | (0.00177) | (0.00448) | (0.00479) | (0.0159) |
| Post-sanctions x Swap line x Sanctioning | | | **-0.0206*** ** | **-0.0139*** ** | **-0.0473*** ** |
| | | | (0.00451) | (0.00480) | (0.0172) |
| Post-sanctions x Sanctioning | | | **-0.0168*** ** | **-0.0224*** ** | 0.00199 |
| | | | (0.00374) | (0.00411) | (0.00568) |
| Post-sanctions x China | **0.154*** ** | **0.145*** ** | **0.148*** ** | **0.135*** ** | **0.282*** ** |
| | (0.00466) | (0.00522) | (0.00564) | (0.00652) | (0.0214) |
| Swap line | **-0.00204*** ** | **-0.00228*** ** | -0.00262 | -0.00231 | 0.0133 |
| | (0.000417) | (0.000417) | (0.00233) | (0.00235) | (0.0108) |
| Swap line x Sanctioning | | | 0.000837 | 0.000145 | -0.0118 |
| | | | (0.00236) | (0.00239) | (0.0109) |
| Observations | 5,191,160 | 5,193,633 | 5,191,160 | 5,193,633 | 12,397 |
| R-squared | 0.893 | 0.897 | 0.893 | 0.897 | 0.479 |

Source: Russia customs statistics and authors' calculations. ***, **, * denote statistical significance at the 1%. 5%, 10% levels. Standard errors are clustered on products (columns 1-4) or two-way on countries and months (aggregated view, Column 5).

# Event study: Swap line + sanctions effect for neutral countries gradually rising over time

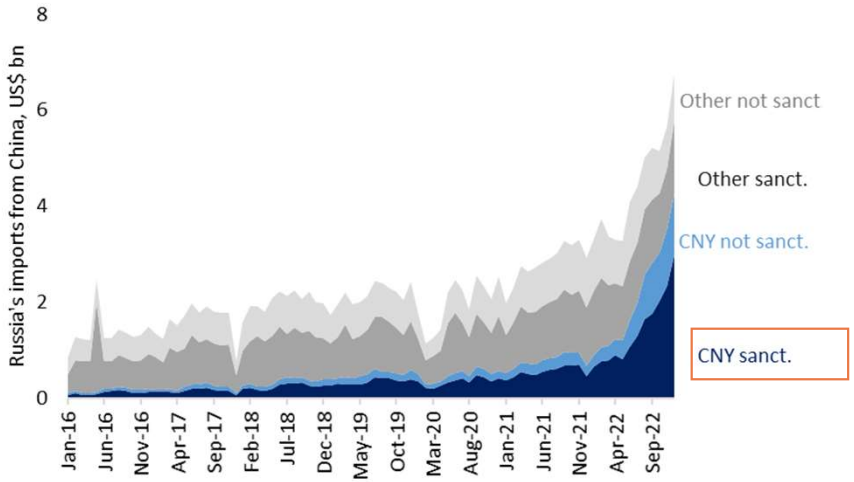
## Sanctioning countries

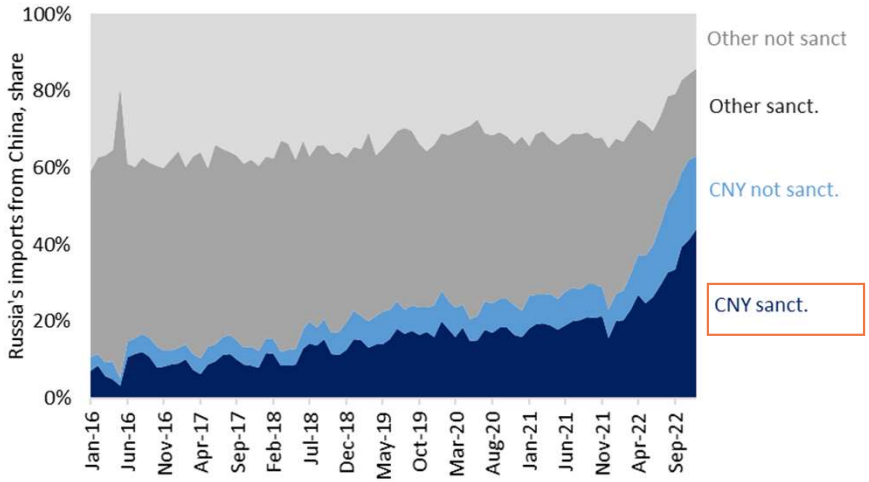



## Neutral countries


Source: Russia customs statistics and authors' calculations. Sanctioning economies are all economies that introduced trade sanctions. Estimated from a single regression, which includes country and month fixed effects. Standard errors are clustered two-way on countries and months.

# Is CNY invoicing used more widely for internationally sanctioned goods?




Source: Russia customs statistics and authors' calculations. Sanctioned good groupings are based on EU sanction packages.

# Significant reduction in (within-firm) use of USD as vehicle, increase in use of producer currencies and CNY as vehicle for trade in dual-use sanctioned goods

For each **firm *f*, product *p*, partner country *i*, and month *t*,** estimate interactions sanctioned Product type * Post-sanctions

Comprehensive sets of fixed effects: firm * month * country and firm * product * country

$$CurrencyShare_{fpit} = \beta\, PostSanctions_t * ProductType_p + \alpha_{fpi} + \alpha_{fti} + \epsilon_{fpit}$$

| Dep. var: share of trade | CNY producer | CNY vehicle | USD vehicle | EUR vehicle | Other producer | RUB |
|---|---|---|---|---|---|---|
| Post-sanctions x Dual-use | **0.00227**** | **0.000337***** | **-0.000932**** | -0.000119 | 0.000275 | 0.000116 |
| | (0.00114) | (0.000105) | (0.000404) | (0.000311) | (0.000331) | (0.000175) |
| Post-sanctions x Industrial | **0.00455***** | 5.39e-05 | **-0.00180***** | 0.000496 | 0.000806 | -0.000102 |
| | (0.00174) | (0.000161) | (0.000674) | (0.000584) | (0.000576) | (0.000321) |
| Post-sanctions x Luxury | **-0.00445*** | -0.000469 | **0.00217**** | **0.00136**** | -8.15e-05 | **-0.00126***** |
| | (0.00233) | (0.000285) | (0.000866) | (0.000557) | (0.000554) | (0.000301) |
| Observations | 4,022,404 | 19,640,186 | 22,797,008 | 13,333,837 | 8,445,851 | 23,662,590 |
| R-squared | 0.922 | 0.957 | 0.977 | 0.980 | 0.974 | 0.985 |

Source: Russia customs statistics and authors' calculations. ***, **, * denote statistical significance at the 1%. 5%, 10% levels. Sanctioned good groupings are based on EU sanction packages. Standard errors are clustered on product groups.

# Aggregate effects (within firms + firm turnover) are significantly larger

Aggregate by product* country* month with product * country and country * month FE

$$CurrencyShare_{pit} = \beta\, PostSanctions_t * ProductType_p + \alpha_{pi} + \alpha_{it} + \epsilon_{pit}$$

| VARIABLES | CNY producer | CNY vehicle | USD vehicle | EUR vehicle | Other producer | RUB |
|---|---|---|---|---|---|---|
| Post-sanctions x Dual-use | **0.0628*** ** | **0.00603*** ** | **-0.0114*** ** | -0.00177 | **0.00653*** ** | -0.00231 |
| | (0.00687) | (0.000664) | (0.00211) | (0.00231) | (0.00132) | (0.00161) |
| Post-sanctions x Industrial | **0.0670*** ** | **0.00437*** ** | **-0.00928** ** | -0.00287 | **0.00403*** | -0.00387 |
| | (0.0122) | (0.00122) | (0.00389) | (0.00452) | (0.00227) | (0.00313) |
| Post-sanctions x Luxury | **-0.0512*** ** | **-0.00429*** ** | **0.00930*** ** | **0.0177*** ** | **-0.00487*** ** | **-0.0341*** ** |
| | (0.00890) | (0.000782) | (0.00286) | (0.00356) | (0.00177) | (0.00234) |
| Observations | 240,255 | 4,353,377 | 4,428,958 | 2,755,898 | 2,350,969 | 4,593,632 |
| R-squared | 0.392 | 0.432 | 0.723 | 0.704 | 0.561 | 0.699 |

Source: Russia customs statistics and authors' calculations. ***, **, * denote statistical significance at the 1%. 5%, 10% levels. Standard errors are clustered on product groups.

# Intermediated trade is more likely to use producer currencies incl. CNY, CNY as vehicle, less likely to use USD as a vehicle currency (same products, partner countries, firms)

Focus on Post-sanctions trade from neutral economies and distinguish between Intermediated versus neutral trade
Aggregate by firm * product *country*month * trade type with firm * product * country and product * country * month FE

Intermediated trade: Goods of sanctioning origin or under Western trademarks exported by traders in neutral economies
Neutral trade: Goods of neutral origin under neutral trademarks exported by traders in neutral economies

$$CurrencyShare_{fpitn} = \beta_1 \, Intermediated_n + \alpha_{pit} + \alpha_{fpi} + \varepsilon_{fpitn}$$

| VARIABLES | CNY producer | CNY vehicle | USD vehicle | EUR vehicle | Other producer | RUB |
|---|---|---|---|---|---|---|
| Intermediated | **0.0108*** ** | **0.00235** ** | **-0.0111*** ** | **0.00400*** | **0.00194*** ** | 0.000447 |
| | (0.00256) | (0.00109) | (0.00245) | (0.00217) | (0.000499) | (0.000389) |
| Observations | 653,601 | 405,170 | 1,057,424 | 1,057,297 | 402,349 | 1,058,771 |
| R-squared | 0.809 | 0.852 | 0.848 | 0.931 | 0.825 | 0.885 |

Source: Russia customs statistics and authors' calculations. ***, **, * denote statistical significance at the 1%. 5%, 10% levels. Standard errors are clustered on product groups. Sample restricted to neutral economies and the post-sanctions period (where intermediated trade is defined and prevalent).

# Effects are also observed for log trade volume invoiced in a given currency: For sanctioned products, volumes in USD as vehicle currency are down, CNY up

Sometimes effects can pull in opposite directions when trade diversion is strong:

USD volumes are up in trade with neutral countries vs sanctioning even as shares are down

| | Sanctions | | | Countries | | |
|---|---|---|---|---|---|---|
| Dep.var: log | CNY producer | CNY vehicle | USD vehicle | CNY | USD vehicle | Producer |
| Post-sanctions x Dual-use | **0.443*** ** | **0.626*** ** | **-0.112*** ** | | | |
| | (0.0537) | (0.0984) | (0.0268) | | | |
| Post-sanctions x Industrial | **0.333*** ** | 0.251 | 0.0835 | | | |
| | (0.0947) | (0.181) | (0.0535) | | | |
| Post-sanctions x Luxury | **-0.452*** ** | 0.00360 | -0.0370 | | | |
| | (0.0657) | (0.112) | (0.0312) | | | |
| Post-sanctions x China | | | | **0.697** ** | **1.069*** ** | **2.475*** ** |
| | | | | (0.347) | (0.179) | (0.155) |
| Post-sanctions x Neutral | | | | **0.897*** | **0.910*** ** | **1.406*** ** |
| | | | | (0.470) | (0.213) | (0.428) |
| Observations | 136,038 | 58,535 | 2,245,265 | 1,623 | 11,096 | 4,469 |
| R-squared | 0.615 | 0.612 | 0.702 | 0.798 | 0.879 | 0.900 |

Source: Russia customs statistics and authors' calculations. ***, **, * denote statistical significance at the 1%. 5%, 10% levels. Standard errors are clustered on product groups (columns 1-3) or countries (columns 4-6).

# What kind of firms tend to process invoices in a particular currency (before vs after sanctions)?

1,186 firms with **state ownership** >25% (ultimate owners in Orbis)

872 **systemically important** importers (Russia's Ministry of Economic Development list)

- Key employers in an industry, region or market (defined by competition authority)
- Important for national defence, advanced technologies, ICT, transport connectivity
- Of which 705 privately owned

**Large firms:** Max imports > USD 27 million per annum (top 25% of systemic firms)

Size = ln[imports], defined as max imports by a firm in a calendar year across 2016-22

**New firms:** Appear in the dataset for the first time within the last 12 months, non-state or systemic

# Post-sanctions, USD as vehicle used more by larger firms, CNY as producer and vehicle currency by smaller firms (same products, countries): High fixed costs of dealing in USD?

Estimate interactions Firm characteristics * Post-sanctions with firm * product * country and product * country * month FE

$$CurrencyShare_{fpit} = \beta_1 * PostSanctions_t * FirmSize/Type_f + \beta_2 * FirmType_{ft} + \alpha_{pi} + \alpha_{fp} + \epsilon_{fpit}$$

| VARIABLES | CNY producer | CNY vehicle | USD vehicle | EUR vehicle | Other producer | RUB |
|---|---|---|---|---|---|---|
| Post-sanctions x Firm size, log | **-0.00944**** | -0.000923 | **0.00528***** | **0.000956*** | **-0.00258***** | **-0.00293***** |
| | (0.00381) | (0.000677) | (0.00147) | (0.000531) | (0.000899) | (0.000803) |
| Post-sanctions x New firm | -0.00494 | 0.00156 | 0.00419 | 0.000687 | -0.00492 | **-0.00463*** |
| | (0.0115) | (0.00312) | (0.00675) | (0.00288) | (0.00445) | (0.00250) |
| Post-sanctions x Strategic and private | -0.0384 | 0.00278 | 0.0127 | -0.00148 | 0.00474 | 0.0121 |
| | (0.0311) | (0.00371) | (0.0130) | (0.00466) | (0.00393) | (0.00790) |
| Post-sanctions x State-owned | -0.00403 | 0.00106 | 0.0105 | **-0.0256*** | 0.0233 | **0.0180***** |
| | (0.105) | (0.00547) | (0.0369) | (0.0137) | (0.0180) | (0.00687) |
| New firm | **0.0116**** | 0.000231 | -0.000737 | 0.00150 | -0.00199 | -0.00101 |
| | (0.00454) | (0.000427) | (0.00168) | (0.00138) | (0.00176) | (0.00136) |
| Observations | 4,257,916 | 18,404,484 | 21,806,504 | 12,509,264 | 8,141,729 | 23,408,677 |
| R-squared | 0.786 | 0.796 | 0.944 | 0.963 | 0.933 | 0.950 |

Source: Russia customs statistics and authors' calculations. ***, **, * denote statistical significance at the 1%. 5%, 10% levels. Standard errors are clustered on product groups. Firm size = maximum annual imports by a firm across years.

# Post-sanctions, USD as vehicle used more for larger transactions, CNY as producer and vehicle currency for smaller transactions: High fixed costs of dealing in USD?

For each record ***j*** in the data, define transaction size as the sum of purchases by a given importer in a given currency in a given month from a given country (similar to a supermarket bill where one could pay for multiple products – but same currency)

Match transaction size to each record and estimate LPM with product * country * month and firm * product * country FE

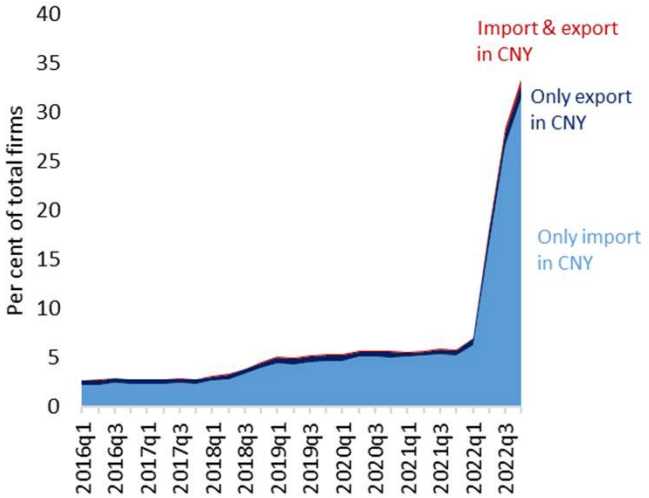
$$Currency_{fpitj} = \beta_1 * PostSanctions_t * logTransSize_j + \beta_2 * logTransSize_j + \alpha_{pit} + \alpha_{fpi} + \epsilon_{fpitj}$$

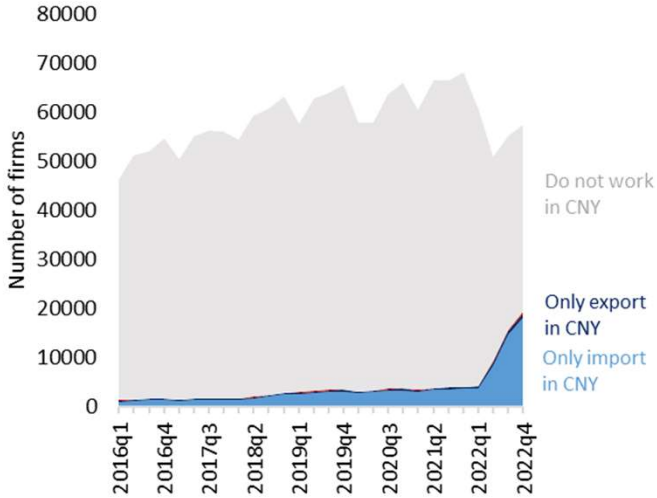
| VARIABLES | CNY producer | CNY vehicle | USD vehicle | EUR vehicle | Other producer | RUB |
|---|---|---|---|---|---|---|
| Post-sanctions x Transaction size, log | **-0.00517*** ** | **-0.00210*** ** | **0.00480*** ** | **0.00148*** ** | -0.000291 | **-0.00781*** ** |
| | (0.00122) | (0.000626) | (0.000683) | (0.000513) | (0.000358) | (0.000651) |
| Transaction size, log | **0.0113*** ** | -7.91e-06 | **-0.00169*** ** | 0.00103 | **-0.00364*** ** | **0.0115*** ** |
| | (0.00179) | (4.88e-05) | (0.000614) | (0.000916) | (0.000570) | (0.000949) |
| Observations | 13,786,404 | 114,774,231 | 124,671,226 | 66,662,473 | 48,986,660 | 128,560,635 |
| R-squared | 0.804 | 0.799 | 0.948 | 0.952 | 0.927 | 0.964 |

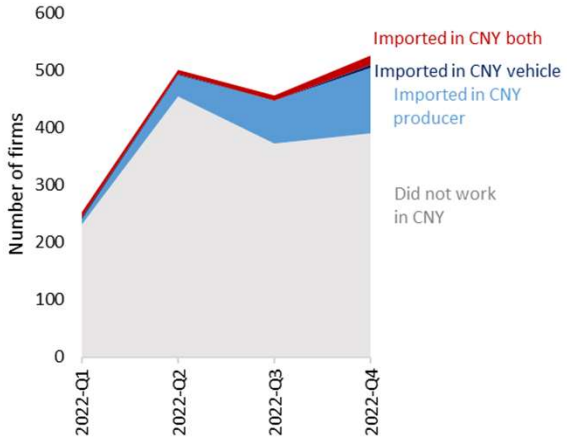
Source: Russia customs statistics and authors' calculations. ***, **, * denote statistical significance at the 1%. 5%, 10% levels. Standard errors are clustered on product groups.

# Hedging / liquidity management by exporters?
# Focus on 1/3 of importers that also export directly

Use of CNY appears to occur first on the import side:
By Q4 2022, 31% of firms only imported in CNY; 1.4% only exported, 0.5% had both exports and imports invoiced in CNY




Source: Russia customs statistics and authors' calculations. Based on 44,889 firms that have both imports and exports recorded.

# No conclusive evidence of hedging from imports to invoicing exports either, looking at firms invoicing in a given quarter depending on invoicing in the previous quarter

Of the firms that only imported in CNY in Q3 2022, 6.5% also export in CNY in Q4 2022 while at the same time 11.6% neither export nor import in CNY

| | | Q4 2022 | | | |
|---|---|---|---|---|---|
| | | Both | Export | Import | Neither |
| Q3 2022 | Both | 72.0 | 5.0 | 21.1 | 1.9 |
| | Export | 23.2 | 57.9 | 9.5 | 9.5 |
| | Import | 5.9 | 0.6 | 81.9 | 11.6 |
| | Neither | 0.6 | 1.7 | 13.8 | 83.9 |

| | | Q4 2021 | | | |
|---|---|---|---|---|---|
| | | Both | Export | Import | Neither |
| Q3 2021 | Both | 70.2 | 3.5 | 26.3 | 0.0 |
| | Export | 2.4 | 73.2 | 4.9 | 19.5 |
| | Import | 2.8 | 0.4 | 83.2 | 13.6 |
| | Neither | 0.0 | 0.2 | 1.5 | 98.3 |

Source: Russia customs statistics and authors' calculations. Transition matrices: Columns show probability of having exports and / or imports invoiced in CNY in the next quarter depending on the use of invoicing in CNY in the previous quarter. Rows add up to 100%.

# Conclusions

The **share of Russia's imports invoiced in yuan (CNY) increased by 17% points, CNY as a vehicle currency up**

**Use of CNY as a vehicle currency increased by 4% points** for trading partners that have an active PBOC swap line and **did not impose economic sanctions** on Russia

CNY share increased more for trade in (internationally) **sanctioned dual-use** and **industrial goods**, and for **intermediated trade** (sanctioning countries of origin or Western trademarks)

**Higher compliance-driven fixed costs of trading in USD:** Switching to CNY away from USD for smaller transactions, smaller firms, controlling for products and types of trade

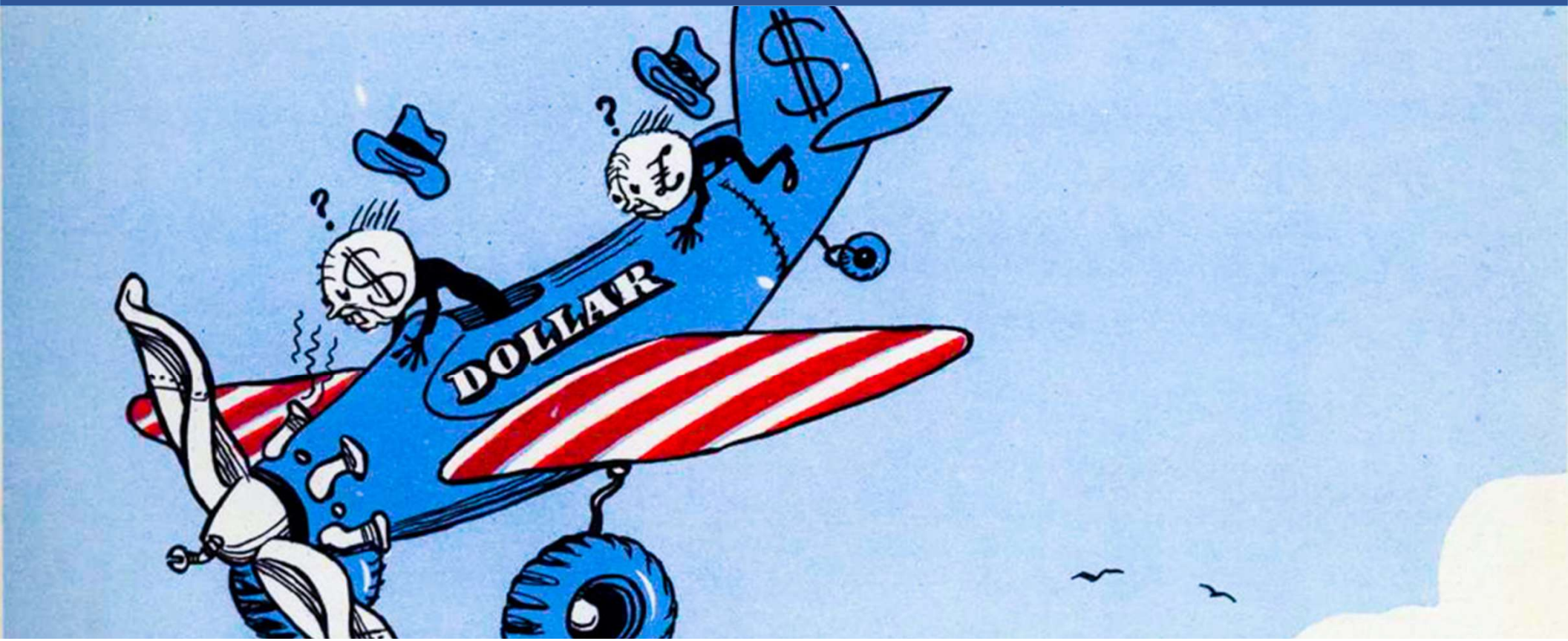
**Hedging** / utilizing CNY receipts by exporters? No evidence

*So what?*

USD dominance boosts sanction effectiveness – but sanctions may undermine USD dominance over time

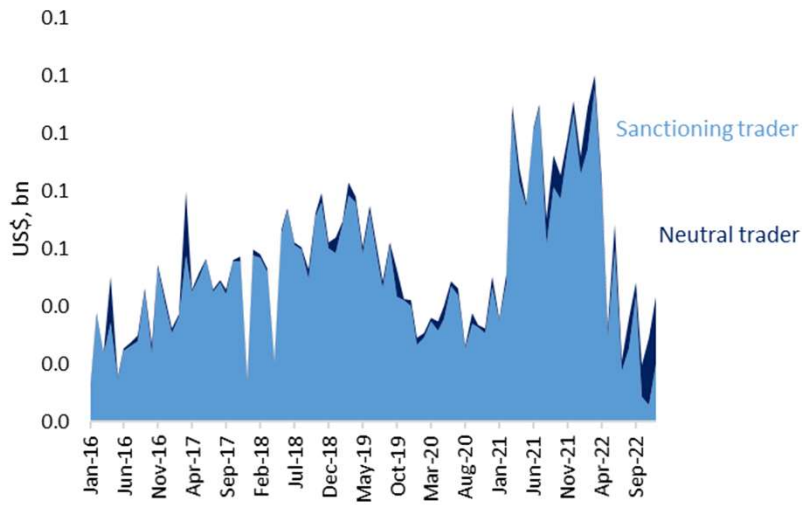
# Annex

European Bank
for Reconstruction and Development



# Intermediated trade type 1: Sanctioning country of origin, exported previously by trader in a sanctioning economy, now by a trader in neutral economy

## Japanese industrial equipment producer

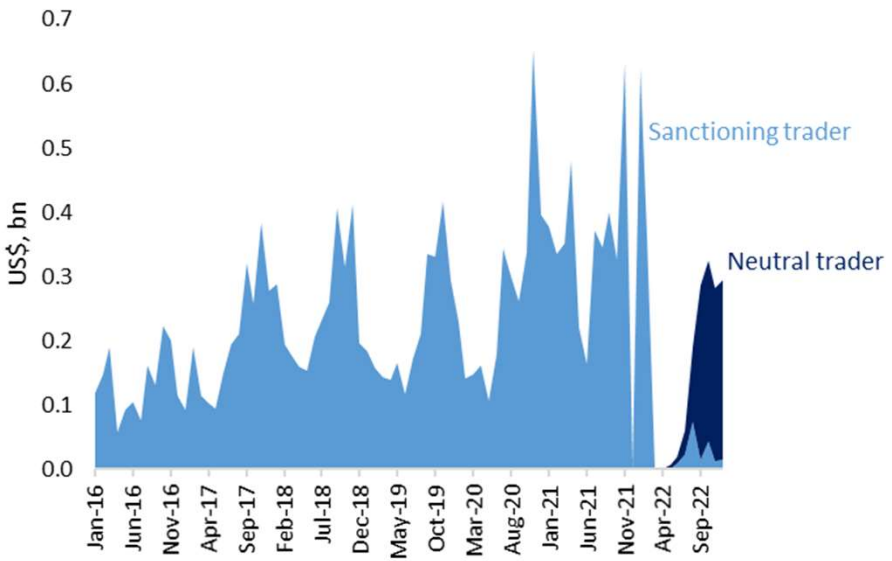



| March-December 2021 | | March-December 2022 | |
|---|---|---|---|
| Trading country | US$, bn | Trading country | US$, bn |
| Japan | 0.735 | Japan | 0.382 |
| Germany | 0.079 | China | 0.048 |
| United States | 0.029 | Indonesia | 0.030 |
| Sweden | 0.028 | Germany | 0.013 |
| Hong Kong | 0.023 | United States | 0.009 |
| Belgium | 0.014 | Belarus | 0.006 |
| Indonesia | 0.010 | Azerbaijan | 0.004 |
| China | 0.005 | United Arab Emirates | 0.002 |
| Russia | 0.004 | Estonia | 0.002 |
| Estonia | 0.003 | Turkey | 0.001 |

Source: Russia customs statistics and authors' calculations.

# Intermediated trade type 2: Neutral origin, Western trademark exported previously by trader in a sanctioning economy, now by a trader in neutral economy

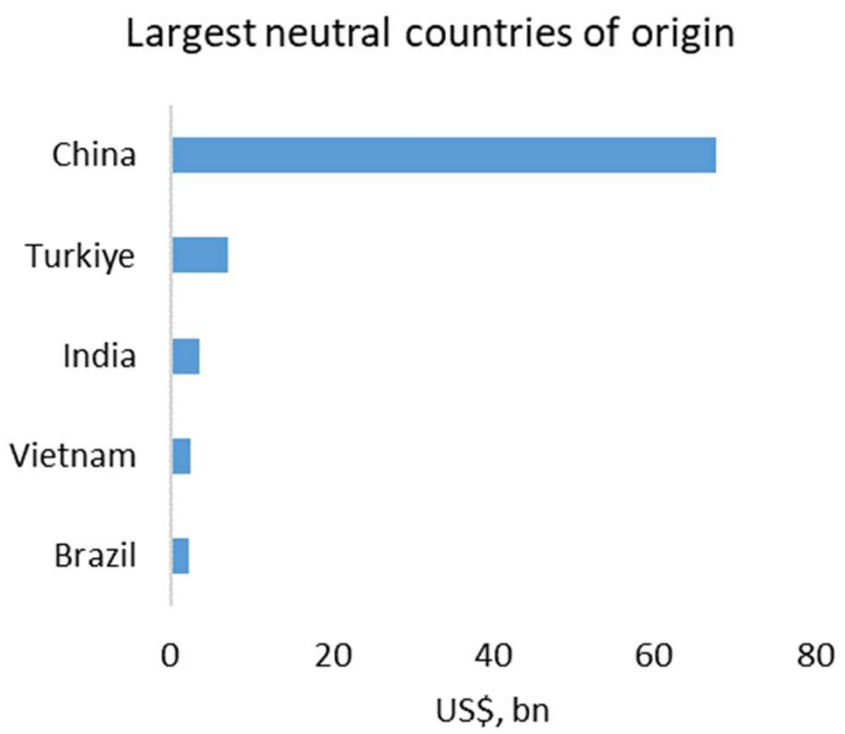
## High-end electronics (US brand)

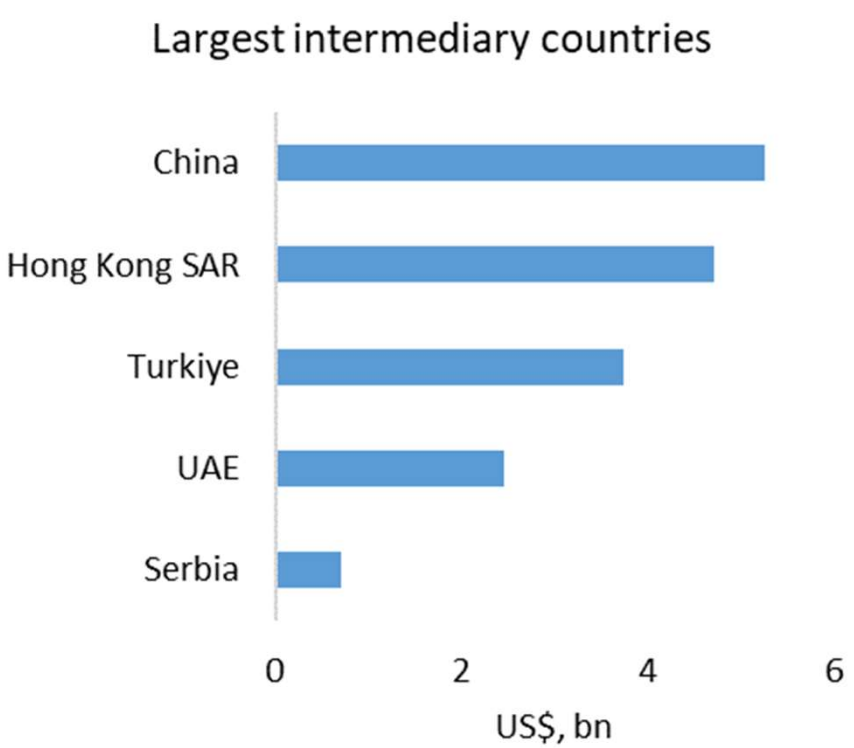



| March-December 2021 | | March-December 2022 | |
|---|---|---|---|
| Trading country | US$, bn | Trading country | US$, bn |
| Ireland | 3.29 | Hong Kong | 0.56 |
| Germany | 0.00 | United Arab Emirates | 0.47 |
| France | 0.00 | United Kingdom | 0.17 |
| United States | 0.00 | Kyrgyz Republic | 0.07 |
| Latvia | 0.00 | Turkey | 0.06 |
| Bulgaria | 0.00 | China | 0.04 |
| Denmark | 0.00 | Serbia | 0.04 |
| United Kingdom | 0.00 | Uzbekistan | 0.02 |
| China | 0.00 | Ireland | 0.02 |
| Netherlands | 0.00 | Kazakhstan | 0.02 |

Source: Russia customs statistics and authors' calculations.

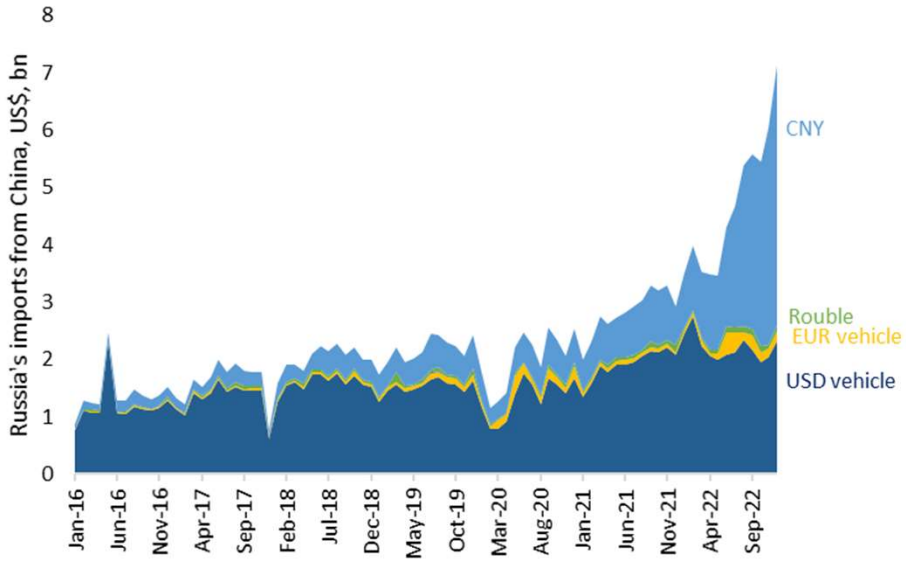
# Geography of intermediated trade is varied

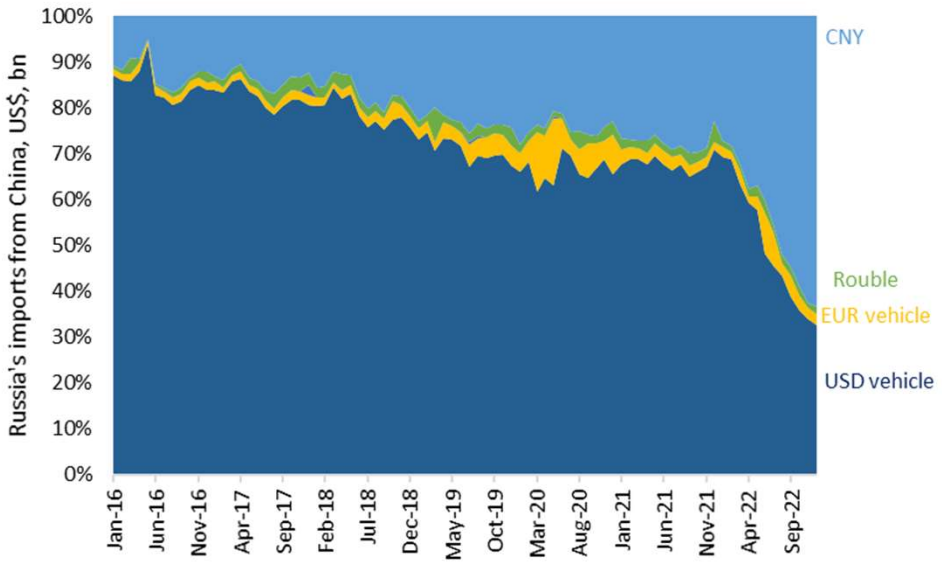



Source: Russia customs statistics and authors' calculations.

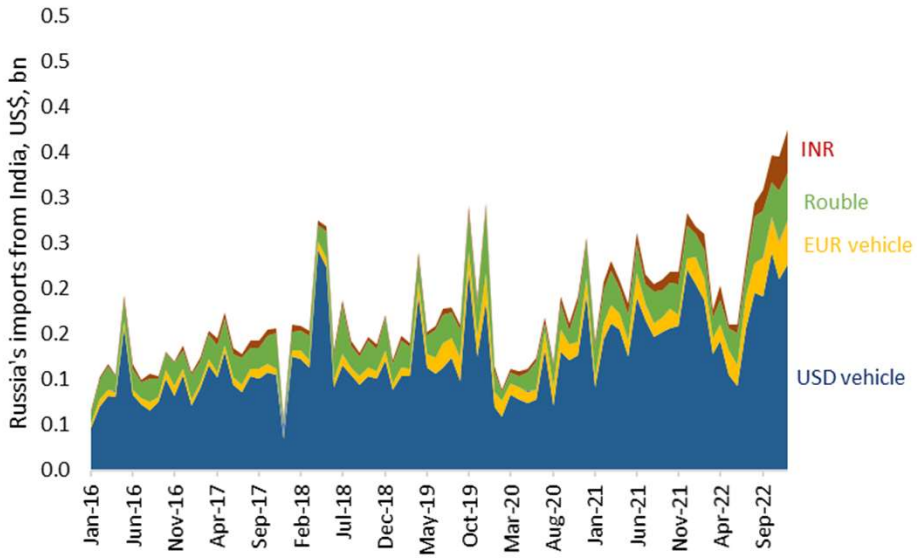
# Use of currencies of invoicing in trade with China

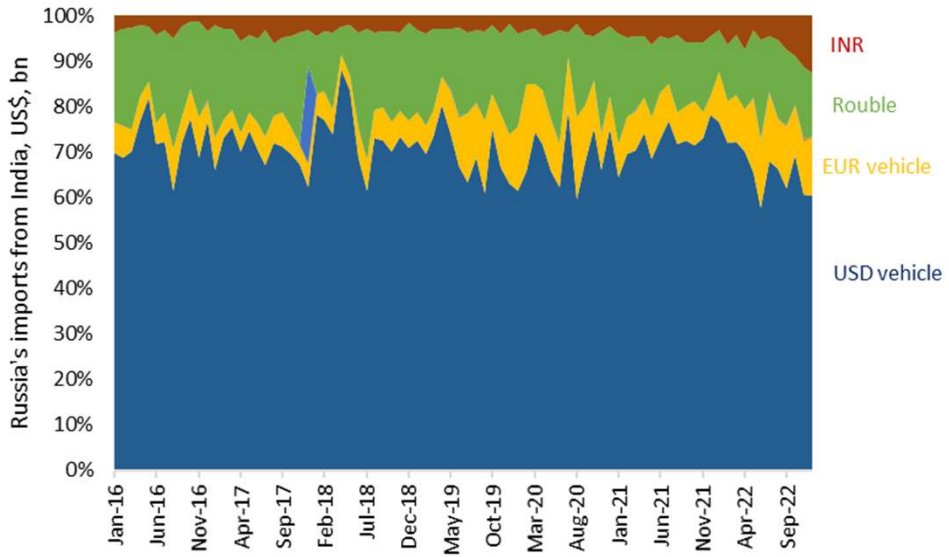



Source: Russia customs statistics and authors' calculations.

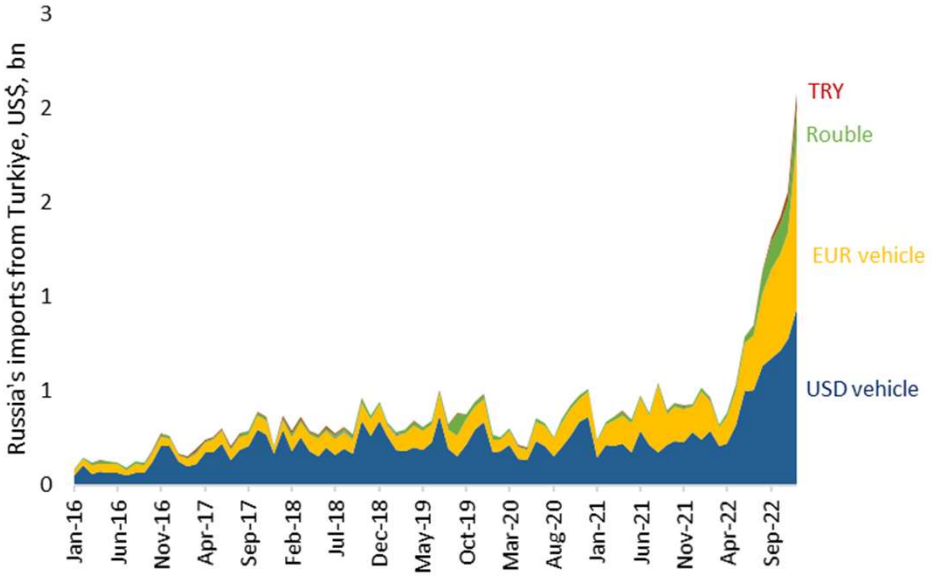
# Use of currencies of invoicing in trade with India

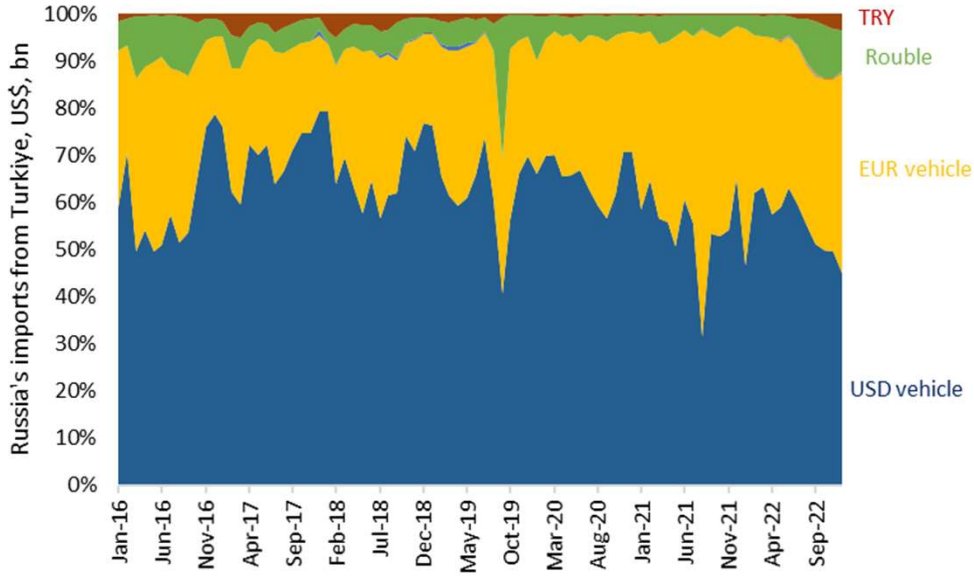



Source: Russia customs statistics and authors' calculations.

# Use of currencies of invoicing in trade with Turkiye




Source: Russia customs statistics and authors' calculations.

# Sanctioning economies

**Sanctioning Economies**

**European Economic Area**

| | | |
|---|---|---|
| Austria | Belgium | Bulgaria |
| Croatia | Cyprus | Czech R. |
| Denmark | Estonia | Finland |
| France | Germany | Greece |
| Hungary | Iceland | Ireland |
| Italy | Latvia | Liechtenstein |
| Lithuania | Luxembourg | Malta |
| Netherlands | Norway | Poland |
| Portugal | Romania | Slovak R. |
| Slovenia | Spain | Sweden |

**Other**

| | | |
|---|---|---|
| Albania | Australia | Canada |
| Japan | Monaco | Montenegro |
| New Zealand | North Macedonia | Singapore |
| South Korea | Switzerland | Taipei China |
| Ukraine | United Kingdom | United States |

Source: Authors.

# Semi-placebo: Swap-line effect, by country of origin of goods (instead of trading country)

| | Swap lines | | Swap lines and sanctioning vs neutral | |
|---|---|---|---|---|
| VARIABLES | By volume | By number | By volume | By number |
| Post-sanctions x Swap line | -0.00416 | 0.000447 | 0.00131 | 0.00830 |
| | (0.00604) | (0.00695) | (0.0102) | (0.0128) |
| Post-sanctions x Swap line x Sanctioning | | | -0.00844 | -0.0149 |
| | | | (0.0136) | (0.0148) |
| Post-sanctions x Sanctioning | | | -0.00141 | 0.00154 |
| | | | (0.00920) | (0.00810) |
| Post-sanctions x China | **0.240*** ** | **0.230*** ** | **0.240*** ** | **0.230*** ** |
| | (0.0125) | (0.00703) | (0.0147) | (0.0101) |
| Swap line | -0.00164 | -0.000544 | -0.00270 | -0.00228 |
| | (0.00224) | (0.00135) | (0.00186) | (0.00189) |
| Swap line x Sanctioning | | | 0.00276 | 0.00578 |
| | | | (0.00695) | (0.00383) |
| Observations | 15,214 | 15,215 | 15,214 | 15,215 |
| R-squared | 0.205 | 0.196 | 0.205 | 0.196 |

Source: Russia customs statistics and authors' calculations. ***, **, * denote statistical significance at the 1%. 5%, 10% levels. Standard errors are clustered on products (columns 1-4) or two-way on countries and months (aggregated view, Column 5).