

# SANCTIONS AND THE EXCHANGE RATE

Itskhoki and Mukhin

Dicussion by Laura Castillo-Martínez  
Duke University

**Global Research Forum on International  
Macroeconomics and Finance**

FRB New York

17<sup>th</sup> Nov 2022

# SUMMARY OF PAPER

# SUMMARY OF PAPER

*As a result of these unprecedented sanctions, the ruble almost is immediately reduced to rubble*

President Biden, March 26<sup>th</sup> 2022

- ▶ Russia has been the target of economic sanctions since February
- ▶ Movements in the ruble often used as a measure of success

# SUMMARY OF PAPER

*As a result of these unprecedented sanctions, the ruble almost is immediately reduced to rubble*

President Biden, March 26<sup>th</sup> 2022

- ▶ Russia has been the target of economic sanctions since February
- ▶ Movements in the ruble often used as a measure of success
- ▶ This paper explores **the effect of sanctions on the exchange rate**

# SUMMARY OF PAPER

*As a result of these unprecedented sanctions, the ruble almost is immediately reduced to rubble*

President Biden, March 26<sup>th</sup> 2022

- ▶ Russia has been the target of economic sanctions since February
- ▶ Movements in the ruble often used as a measure of success
- ▶ This paper explores **the effect of sanctions on the exchange rate**
- ▶ Build a model of a small open economy with:
  - \* Endowment of non-tradables, imports and exports
  - \* Consumers derive utility from consumption and foreign currency bonds
  - \* Asset market segmentation
  - \* Policy: reserve accumulation, domestic price and return on foreign bonds

# SUMMARY OF PAPER

*As a result of these unprecedented sanctions, the ruble almost is immediately reduced to rubble*

President Biden, March 26<sup>th</sup> 2022

- ▶ Russia has been the target of economic sanctions since February
- ▶ Movements in the ruble often used as a measure of success
- ▶ This paper explores **the effect of sanctions on the exchange rate**
- ▶ Build a model of a small open economy with:
  - \* Endowment of non-tradables, imports and exports
  - \* Consumers derive utility from consumption and foreign currency bonds
  - \* Asset market segmentation
  - \* Policy: reserve accumulation, domestic price and return on foreign bonds
- ▶ Analytical model: develop intuition on different mechanisms at play

# SUMMARY OF PAPER

*As a result of these unprecedented sanctions, the ruble almost is immediately reduced to rubble*

President Biden, March 26<sup>th</sup> 2022

- ▶ Russia has been the target of economic sanctions since February
- ▶ Movements in the ruble often used as a measure of success
- ▶ This paper explores **the effect of sanctions on the exchange rate**
- ▶ Build a model of a small open economy with:
  - \* Endowment of non-tradables, imports and exports
  - \* Consumers derive utility from consumption and foreign currency bonds
  - \* Asset market segmentation
  - \* Policy: reserve accumulation, domestic price and return on foreign bonds
- ▶ Analytical model: develop intuition on different mechanisms at play
- ▶ Quantitative analysis: decompose effect of individual sanctions

# UNDERSTANDING THE MECHANISM

STATIONARY EQUILIBRIUM



# UNDERSTANDING THE MECHANISM

## STATIONARY EQUILIBRIUM

Import demand:

$$C_F = \frac{\gamma}{1-\gamma} \frac{P}{\epsilon P^*} Y$$

Balance of payments:

$$P^* C^F = Y^* + (1 - \beta) F^*$$

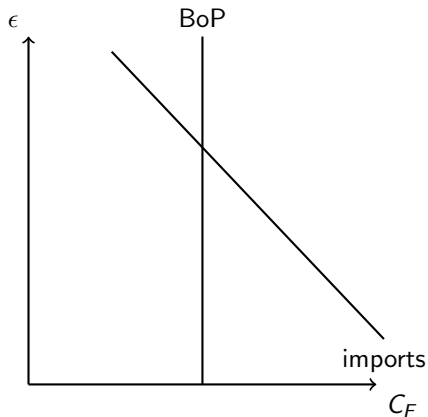
# UNDERSTANDING THE MECHANISM

## STATIONARY EQUILIBRIUM

Import demand:

Balance of payments:

$$C_F = \frac{\gamma}{1-\gamma} \frac{P}{\epsilon P^*} Y$$
$$P^* C^F = Y^* + (1 - \beta) F^*$$



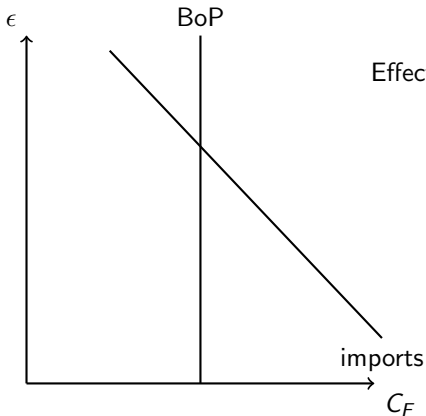
# UNDERSTANDING THE MECHANISM

## STATIONARY EQUILIBRIUM

Import demand:

Balance of payments:

$$C_F = \frac{\gamma}{1-\gamma} \frac{P}{\epsilon P^*} Y$$
$$P^* C^F = Y^* + (1 - \beta) F^*$$



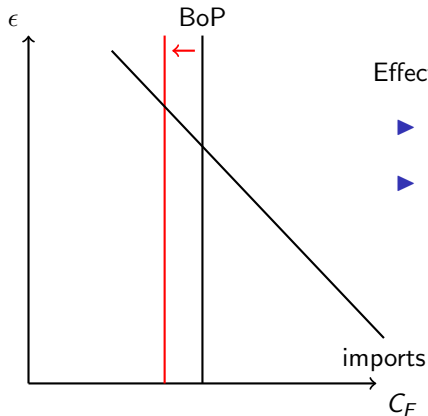
Effect on sanctions on  $\epsilon$  and  $C^F$ :

# UNDERSTANDING THE MECHANISM

## STATIONARY EQUILIBRIUM

Import demand:  
Balance of payments:

$$C_F = \frac{\gamma}{1-\gamma} \frac{P}{\epsilon P^*} Y$$
$$P^* C^F = Y^* + (1 - \beta) F^*$$



Effect on sanctions on  $\epsilon$  and  $C^F$ :

- ▶ Export limit  $Y^* \downarrow$ :  $\epsilon \uparrow$ ,  $C^F \downarrow$
- ▶ Foreign reserve freeze  $F^* \downarrow$ :  $\epsilon \uparrow$ ,  $C^F \downarrow$

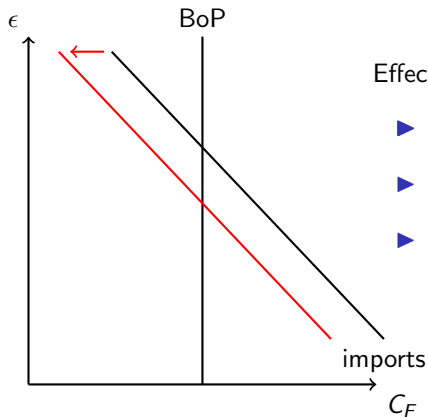
# UNDERSTANDING THE MECHANISM

## STATIONARY EQUILIBRIUM

Import demand:

Balance of payments:

$$C_F = \frac{\gamma}{1-\gamma} \frac{P}{\epsilon P^*} Y$$
$$P^* C^F = Y^* + (1 - \beta) F^*$$



Effect on sanctions on  $\epsilon$  and  $C^F$ :

- ▶ Export limit  $Y^* \downarrow$ :  $\epsilon \uparrow$ ,  $C^F \downarrow$
- ▶ Foreign reserve freeze  $F^* \downarrow$ :  $\epsilon \uparrow$ ,  $C^F \downarrow$
- ▶ Production deterrents  $Y \downarrow$ :  $\epsilon \downarrow$ ,  $C^F =$

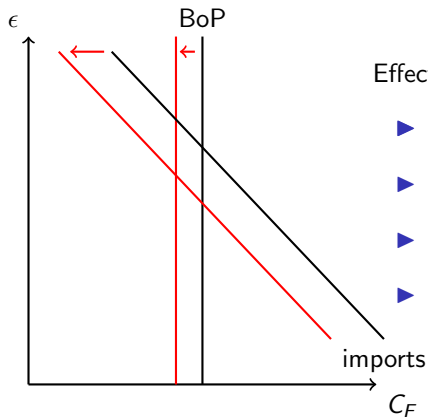
# UNDERSTANDING THE MECHANISM

## STATIONARY EQUILIBRIUM

Import demand:

Balance of payments:

$$C_F = \frac{\gamma}{1-\gamma} \frac{P}{\epsilon P^*} Y$$
$$P^* C^F = Y^* + (1 - \beta) F^*$$



Effect on sanctions on  $\epsilon$  and  $C^F$ :

- ▶ Export limit  $Y^* \downarrow$ :  $\epsilon \uparrow$ ,  $C^F \downarrow$
- ▶ Foreign reserve freeze  $F^* \downarrow$ :  $\epsilon \uparrow$ ,  $C^F \downarrow$
- ▶ Production deterrents  $Y \downarrow$ :  $\epsilon \downarrow$ ,  $C^F =$
- ▶ Import rationing  $P^* \uparrow$ :  $\epsilon \downarrow$ ,  $C^F \downarrow$

# UNDERSTANDING THE MECHANISM

## DYNAMIC EQUILIBRIUM

# UNDERSTANDING THE MECHANISM

## DYNAMIC EQUILIBRIUM

$$C_{Ft} = \frac{\gamma}{1 - \gamma} \frac{P_t}{\epsilon_t P_t^*} Y_t \quad (1)$$

$$\frac{F_{t+1}^*}{R_t^*} - F_t^* = Y_t^* - P_t^* C_{Ft} \quad (2)$$

$$\beta R_{Ht}^* \mathbb{E}_t \left\{ \frac{P_t^*}{P_{t+1}^*} \left[ \frac{C_{Ft}}{C_{F,t+1}} + \tilde{\kappa} C_{Ft} \left( \Psi_t - \frac{B_{t+1}^*}{P_{t+1}^*} \right) \right] \right\} = 1 \quad (3)$$



# UNDERSTANDING THE MECHANISM

## DYNAMIC EQUILIBRIUM

$$C_{Ft} = \frac{\gamma}{1 - \gamma} \frac{P_t}{\epsilon_t P_t^*} Y_t \quad (1)$$

$$\frac{F_{t+1}^*}{R_t^*} - F_t^* = Y_t^* - P_t^* C_{Ft} \quad (2)$$

$$\beta R_{Ht}^* \mathbb{E}_t \left\{ \frac{P_t^*}{P_{t+1}^*} \left[ \frac{C_{Ft}}{C_{F,t+1}} + \tilde{\kappa} C_{Ft} \left( \Psi_t - \frac{B_{t+1}^*}{P_{t+1}^*} \right) \right] \right\} = 1 \quad (3)$$

- An increase in  $\Psi_t$  results in excess foreign currency demand:  $B_{t+1}^* \uparrow$

# UNDERSTANDING THE MECHANISM

## DYNAMIC EQUILIBRIUM

$$C_{Ft} = \frac{\gamma}{1-\gamma} \frac{P_t}{\epsilon_t P_t^*} Y_t \quad (1)$$

$$\frac{F_{t+1}^*}{R_t^*} - F_t^* = Y_t^* - P_t^* C_{Ft} \quad (2)$$

$$\beta R_t^* \mathbb{E}_t \left\{ \frac{P_t^*}{P_{t+1}^*} \left[ \frac{C_{Ft}}{C_{F,t+1}} + \tilde{\kappa} C_{Ft} \left( \Psi_t - \frac{R_t^* (Y_t^* - P_t^* C_{Ft} + F_t^*)}{P_{t+1}^*} \right) \right] \right\} = 1 \quad (3)$$

- ▶ An increase in  $\Psi_t$  results in excess foreign currency demand:  $B_{t+1}^* \uparrow$
- ▶ Suppose  $F_{t+1}^* = B_{t+1}^*$  and  $R_{Ht}^* = R_t^*$ :

# UNDERSTANDING THE MECHANISM

## DYNAMIC EQUILIBRIUM

$$C_{Ft} = \frac{\gamma}{1-\gamma} \frac{P_t}{\epsilon_t P_t^*} Y_t \quad (1)$$

$$\frac{F_{t+1}^*}{R_t^*} - F_t^* = Y_t^* - P_t^* C_{Ft} \quad (2)$$

$$\beta R_t^* \mathbb{E}_t \left\{ \frac{P_t^*}{P_{t+1}^*} \left[ \frac{C_{Ft}}{C_{F,t+1}} + \tilde{\kappa} C_{Ft} \left( \Psi_t - \frac{R_t^* (Y_t^* - P_t^* C_{Ft} + F_t^*)}{P_{t+1}^*} \right) \right] \right\} = 1 \quad (3)$$

- ▶ An increase in  $\Psi_t$  results in excess foreign currency demand:  $B_{t+1}^* \uparrow$
- ▶ Suppose  $F_{t+1}^* = B_{t+1}^*$  and  $R_{Ht}^* = R_t^*$ :
  - \* On impact,  $C_{Ft}$  falls and  $\epsilon_t$  increases

# UNDERSTANDING THE MECHANISM

## DYNAMIC EQUILIBRIUM

$$C_{Ft} = \frac{\gamma}{1-\gamma} \frac{P_t}{\epsilon_t P_t^*} Y_t \quad (1)$$

$$\frac{F_{t+1}^*}{R_t^*} - F_t^* = Y_t^* - P_t^* C_{Ft} \quad (2)$$

$$\beta R_t^* \mathbb{E}_t \left\{ \frac{P_t^*}{P_{t+1}^*} \left[ \frac{C_{Ft}}{C_{F,t+1}} + \tilde{\kappa} C_{Ft} \left( \Psi_t - \frac{R_t^* (Y_t^* - P_t^* C_{Ft} + F_t^*)}{P_{t+1}^*} \right) \right] \right\} = 1 \quad (3)$$

- ▶ An increase in  $\Psi_t$  results in excess foreign currency demand:  $B_{t+1}^* \uparrow$
- ▶ Suppose  $F_{t+1}^* = B_{t+1}^*$  and  $R_{Ht}^* = R_t^*$ :
  - \* On impact,  $C_{Ft}$  falls and  $\epsilon_t$  increases
  - \* There is mean reversion and overshooting in the long run

# UNDERSTANDING THE MECHANISM

## DYNAMIC EQUILIBRIUM

$$C_{Ft} = \frac{\gamma}{1-\gamma} \frac{P_t}{\epsilon_t P_t^*} Y_t \quad (1)$$

$$\frac{F_{t+1}^*}{R_t^*} - F_t^* = Y_t^* - P_t^* C_{Ft} \quad (2)$$

$$\beta R_{Ht}^* \mathbb{E}_t \left\{ \frac{P_t^*}{P_{t+1}^*} \left[ \frac{C_{Ft}}{C_{F,t+1}} + \tilde{\kappa} C_{Ft} \left( \Psi_t - \frac{B_{t+1}^*}{P_{t+1}^*} \right) \right] \right\} = 1 \quad (3)$$

- ▶ An increase in  $\Psi_t$  results in excess foreign currency demand:  $B_{t+1}^* \uparrow$
- ▶ Suppose  $F_{t+1}^* = B_{t+1}^*$  and  $R_{Ht}^* = R_t^*$ :
  - \* On impact,  $C_{Ft}$  falls and  $\epsilon_t$  increases
  - \* There is mean reversion and overshooting in the long run
- ▶ FX interventions or financial repression keep  $(C_{Ft}, \epsilon_t)$  unchanged.

# SOME REMARKS

## SOME REMARKS

A must-read: timely question, serious while intuitive analytical model & revealing quantification exercise

## SOME REMARKS

A must-read: timely question, serious while intuitive analytical model & revealing quantification exercise

Summary of my main comments

1. Russia is not small on energy markets
  - ▶ Potentially interesting second-round effects
2. Paper builds on a specific output - exchange rates interaction
  - ▶ There are alternatives worth exploring
3. The exchange rate is not the right metric, I agree
  - ▶ Then, more on effects of sanctions on fiscal resources



# COMMENT I: RUSSIA AS A SMALL OPEN ECONOMY

## COMMENT I: RUSSIA AS A SMALL OPEN ECONOMY

- ▶ The **small** open economy assumption simplifies analysis: take international prices as given

## COMMENT I: RUSSIA AS A SMALL OPEN ECONOMY

- ▶ The **small** open economy assumption simplifies analysis: take international prices as given
- ▶ However, Russia is a big player in energy markets

## COMMENT I: RUSSIA AS A SMALL OPEN ECONOMY

- ▶ The **small** open economy assumption simplifies analysis: take international prices as given
- ▶ However, Russia is a big player in energy markets
  - \* Export sanctions  $\Rightarrow$  higher global energy prices

## COMMENT I: RUSSIA AS A SMALL OPEN ECONOMY

- ▶ The **small** open economy assumption simplifies analysis: take international prices as given
- ▶ However, Russia is a big player in energy markets
  - \* Export sanctions  $\Rightarrow$  higher global energy prices
- ▶ Implication 1: export revenues in Russia have increased

## COMMENT I: RUSSIA AS A SMALL OPEN ECONOMY

- ▶ The **small** open economy assumption simplifies analysis: take international prices as given
- ▶ However, Russia is a big player in energy markets
  - \* Export sanctions  $\Rightarrow$  higher global energy prices
- ▶ Implication 1: export revenues in Russia have increased
- ▶ Implication 2: RoW is on the brink of a recession:  $R_t^* \uparrow$

## COMMENT I: RUSSIA AS A SMALL OPEN ECONOMY

- ▶ The **small** open economy assumption simplifies analysis: take international prices as given
- ▶ However, Russia is a big player in energy markets
  - \* Export sanctions  $\Rightarrow$  higher global energy prices
- ▶ Implication 1: export revenues in Russia have increased
- ▶ Implication 2: RoW is on the brink of a recession:  $R_t^* \uparrow$

$$\beta R_t^* \mathbb{E}_t \left\{ \frac{P_t^*}{P_{t+1}^*} \left[ \frac{C_{Ft}}{C_{F,t+1}} + \tilde{\kappa} C_{Ft} \left( \psi_t - \frac{R_t^* (Y_t^* - P_t^* C_{Ft} + F_t^*)}{P_{t+1}^*} \right) \right] \right\} = 1$$

## COMMENT I: RUSSIA AS A SMALL OPEN ECONOMY

- ▶ The **small** open economy assumption simplifies analysis: take international prices as given
- ▶ However, Russia is a big player in energy markets
  - \* Export sanctions  $\Rightarrow$  higher global energy prices
- ▶ Implication 1: export revenues in Russia have increased
- ▶ Implication 2: RoW is on the brink of a recession:  $R_t^* \uparrow$

$$\beta R_t^* \mathbb{E}_t \left\{ \frac{P_t^*}{P_{t+1}^*} \left[ \frac{C_{Ft}}{C_{F,t+1}} + \tilde{\kappa} C_{Ft} \left( \psi_t - \frac{R_t^* (Y_t^* - P_t^* C_{Ft} + F_t^*)}{P_{t+1}^*} \right) \right] \right\} = 1$$

**Suggestion:** explore (and quantify) second round effects



## COMMENT II: REAL INCOME CHANNEL

## COMMENT II: REAL INCOME CHANNEL

- ▶ Literature is increasingly focusing on heterogeneous agents.

## COMMENT II: REAL INCOME CHANNEL

- ▶ Literature is increasingly focusing on heterogeneous agents.
- ▶ Extension featuring hand-to-mouth and Ricardian households in the context of financial repression

## COMMENT II: REAL INCOME CHANNEL

- ▶ Literature is increasingly focusing on heterogeneous agents.
- ▶ Extension featuring hand-to-mouth and Ricardian households in the context of financial repression
  - \* Take-away: financial repression can be welfare enhancing

## COMMENT II: REAL INCOME CHANNEL

- ▶ Literature is increasingly focusing on heterogeneous agents.
- ▶ Extension featuring hand-to-mouth and Ricardian households in the context of financial repression
  - \* Take-away: financial repression can be welfare enhancing
- ▶ Latest contribution of heterogeneity to exchange rate theory is missing: real income channel (Auclert et al 2021)

## COMMENT II: REAL INCOME CHANNEL

- ▶ Literature is increasingly focusing on heterogeneous agents.
- ▶ Extension featuring hand-to-mouth and Ricardian households in the context of financial repression
  - \* Take-away: financial repression can be welfare enhancing
- ▶ Latest contribution of heterogeneity to exchange rate theory is missing: real income channel (Auclert et al 2021)
- ▶ Mechanism works strictly through expenditure switching effect

## COMMENT II: REAL INCOME CHANNEL

- ▶ Literature is increasingly focusing on heterogeneous agents.
- ▶ Extension featuring hand-to-mouth and Ricardian households in the context of financial repression
  - \* Take-away: financial repression can be welfare enhancing
- ▶ Latest contribution of heterogeneity to exchange rate theory is missing: real income channel (Auclert et al 2021)
- ▶ Mechanism works strictly through expenditure switching effect
- ▶ Real income channel reduces ex-rate movements. By how much? What are the welfare implications?

## COMMENT II: REAL INCOME CHANNEL

- ▶ Literature is increasingly focusing on heterogeneous agents.
- ▶ Extension featuring hand-to-mouth and Ricardian households in the context of financial repression
  - \* Take-away: financial repression can be welfare enhancing
- ▶ Latest contribution of heterogeneity to exchange rate theory is missing: real income channel (Auclert et al 2021)
- ▶ Mechanism works strictly through expenditure switching effect
- ▶ Real income channel reduces ex-rate movements. By how much? What are the welfare implications?

**Suggestion:** no need to go full HA, TA should work. Also need domestically consumed tradables.



## COMMENT III: BEYOND THE EXCHANGE RATE

## COMMENT III: BEYOND THE EXCHANGE RATE

- ▶ Main message to general public: exchange rates are NOT a good measure of sanctions' success

## COMMENT III: BEYOND THE EXCHANGE RATE

- ▶ Main message to general public: exchange rates are NOT a good measure of sanctions' success
- ▶ Depreciating the ruble or (directly) hurting consumers was never the final goal of sanctions

## COMMENT III: BEYOND THE EXCHANGE RATE

- ▶ Main message to general public: exchange rates are NOT a good measure of sanctions' success
- ▶ Depreciating the ruble or (directly) hurting consumers was never the final goal of sanctions
- ▶ Sanctions are primarily targeted towards reducing **fiscal capacity** to fund the war - why not spend more time on this?

## COMMENT III: BEYOND THE EXCHANGE RATE

- ▶ Main message to general public: exchange rates are NOT a good measure of sanctions' success
- ▶ Depreciating the ruble or (directly) hurting consumers was never the final goal of sanctions
- ▶ Sanctions are primarily targeted towards reducing **fiscal capacity** to fund the war - why not spend more time on this?
- ▶ Figure 5 (a) shows the dynamics of government revenues and its decomposition into different shocks.

## COMMENT III: BEYOND THE EXCHANGE RATE

- ▶ Main message to general public: exchange rates are NOT a good measure of sanctions' success
- ▶ Depreciating the ruble or (directly) hurting consumers was never the final goal of sanctions
- ▶ Sanctions are primarily targeted towards reducing **fiscal capacity** to fund the war - why not spend more time on this?
- ▶ Figure 5 (a) shows the dynamics of government revenues and its decomposition into different shocks.
  - \* Government resources used to counteract sanctions should also be accounted for.

## COMMENT III: BEYOND THE EXCHANGE RATE

- ▶ Main message to general public: exchange rates are NOT a good measure of sanctions' success
- ▶ Depreciating the ruble or (directly) hurting consumers was never the final goal of sanctions
- ▶ Sanctions are primarily targeted towards reducing **fiscal capacity** to fund the war - why not spend more time on this?
- ▶ Figure 5 (a) shows the dynamics of government revenues and its decomposition into different shocks.
  - \* Government resources used to counteract sanctions should also be accounted for.
  - \* Ultimately what matters is how big is the reduction of fiscal capacity relative to cost of war

## OTHER MINOR COMMENTS

- ▶ While financial sanctions have not fully turned Russia into a financial pariah, why not consider them (at least) partially?
- ▶ Closely related, Eichengreen et al (2022) estimate dynamic responses of exchange rates in a panel of sanction episodes
- ▶ In steady state, government fiscal balance should read

$$W \leq \epsilon(1 - \beta)(F^* - B^*) + \epsilon Y^* + PY$$

If  $B^* = 0$ ,  $F^* - B^*$  does not affect nominal wage commitment



# CONCLUSION

# CONCLUSION

- ▶ First use of economic sanctions dates back to 432 B.C. when Pericles issued the Megarian Decree against Sparta's allies

# CONCLUSION

- ▶ First use of economic sanctions dates back to 432 B.C. when Pericles issued the Megarian Decree against Sparta's allies
- ▶ Its effectiveness remains an unsettled debate among historians!

# CONCLUSION

- ▶ First use of economic sanctions dates back to 432 B.C. when Pericles issued the Megarian Decree against Sparta's allies
- ▶ Its effectiveness remains an unsettled debate among historians!
- ▶ This paper is a leapfrog in the right direction

# CONCLUSION

- ▶ First use of economic sanctions dates back to 432 B.C. when Pericles issued the Megarian Decree against Sparta's allies
- ▶ Its effectiveness remains an unsettled debate among historians!
- ▶ This paper is a leapfrog in the right direction
- ▶ Trade and financial sanctions + precautionary shock + policy response explain the dynamic behavior of the ruble

# CONCLUSION

- ▶ First use of economic sanctions dates back to 432 B.C. when Pericles issued the Megarian Decree against Sparta's allies
- ▶ Its effectiveness remains an unsettled debate among historians!
- ▶ This paper is a leapfrog in the right direction
- ▶ Trade and financial sanctions + precautionary shock + policy response explain the dynamic behavior of the ruble
- ▶ Looking forward to future versions