Capital Controls and Income Inequality[1]

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[1]The views expressed herein are those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of San Francisco or the Federal Reserve System.

Recent studies link capital surges to income inequality

- Liberalizing capital controls found to exacerbate income inequality in EMEs (Furceri and Loungani 2018)
- Theoretical explanations of the channels between capital flows and income inequality are scarce in literature
- Assessment of impact of capital account policy complicated by financial frictions and presence of other policy distortions
- Policymakers' view on capital controls has evolved
  - Surges seen as destabilizing
  - If flows are transitory, then "...use of capital controls——in addition to both prudential and macroeconomic policy——is justified as part of the policy toolkit to manage inflows." (Ostry, et al. 2010)

Capital account policies and income distribution in a GE framework

- OLG model of small open economy
  - Heterogeneous agents (households and entrepreneurs)
  - Intermediation by costly banks
  - Capital account restrictions: taxes on inflows and outflows
- SR and LR capital control impact differs:
  - Short-run transitions: shocks that boost inflows exacerbate inequality; shocks that induce outflows lower inequality
  - Long-run steady state: relaxing controls on either inflows or outflows reduces income inequality

Confirm SR predictions in cross-country panel

- 87 EMEs from 2000-2018
  - Examine impacts of private inflows and outflows on income distribution, measured by GINI
  - Instrument through changes in 2-year treasuries interacted with "remoteness," proxied by great-circle distance from New York
- Results show statistically and economically significant impact of private inflows (+) and outflows (-) on income distribution
- Robust to a large variety of sensitivity tests

Relation to literature

- Distortions from capital account restrictions
  - Financial markets [Edwards (1999), Jeanne (2012)]; Trade [Wei and Zhang (2007)]; Costinot, et al (2014)], Growth [Jeanne (2013)]
- Restrictions as macro policy tool
  - Stabilization policy [Ostry, et al (2010), Farhi and Werning (2012)]; Ease trilemma issues [Chang, et al (2015), Liu and Spiegel (2015)]; Tax [Davis, et al. (2020)]
- Impact of capital account liberalization
  - Undeveloped financial markets [Eichengreen, et al (2011), Ju and Wei (2010)]; Discipline financial markets [Aoki, et al (2009)]; Productivity [Liu, et al (2019)]; Distribution [Bumann and Lesink (2016)]; Furceri and Loungani (2018); Li and Su (2020)]

OLG model of small open economy

- Two types of agents: households (θ) and entrepreneurs ($1-\theta$)
  - Household consumes, works, and saves (i.e., deposits in domestic or foreign banks) when young and consumes accumulated assets when old
  - Entrepreneur consumes, works, invests, and borrows (from domestic or foreign banks) when young; consumes net worth when old
- Domestic bank takes deposits from households and lends to entrepreneurs, subject to intermediation costs
- Government taxes earnings on both capital inflows and outflows: capital controls
- Production function

$$Y_t = AK_{t-1}^{1-\alpha}(H_{ht} + H_{et})^{\alpha}$$

Households (H)

- Utility function

$$U_{ht} = \ln(C^y_{ht}) + \beta \ln(C^o_{h,t+1})$$

- Budget constraints

$$C^y_{ht} + D_t + B^d_{ft} = w_t H_{ht} + \Gamma_{ht},$$

$$C^o_{h,t+1} = R_t D_t + (1 - \tau_d) R^*_t B^d_{ft} + T_{h,t+1} - \Gamma_{h,t+1}.$$

  where $T_{h,t+1}$ denotes bank dividends and government transfers and $\Gamma_{h,t+1}$ denotes bequest

- Capital outflow tax creates wedge between domestic deposit rate R and world rate R^*

$$R_t = (1 - \tau_d) R^*_t$$

Entrepreneurs (E)

- Utility function

$$U_{et} = \ln(C^y_{et}) + \beta \ln(C^o_{e,t+1})$$

- Budget constraints

$$C^y_{et} + q^k_t K^o_t + I_t + \frac{\Omega_k}{2}\left(\frac{I_t}{K^o_t} - \frac{\bar{I}}{\bar{K}^o}\right)^2 K^o_t = w_t H_{et} + B_{et} + \Gamma_{et},$$

$$C^o_{e,t+1} = \left[q^k_{t+1}(1-\delta) + r^k_{t+1}\right](K^o_t + I_t) - R_{lt} B_{et} + T_{e,t+1} - \Gamma_{e,t+1}.$$

- Capital stock follows the law of motion

$$K_t = (1-\delta)K_{t-1} + I_t$$

where $K_t \equiv K^o_t + I_t$ denotes end-of-period capital stock

Banks and Foreign Investors

- Competitive banks take deposits D_t from H and make loans B_t to E

$$R_{lt} B_t = R_t D_t$$

- Financial intermediation costs (Curdia-Woodford 2016): $\Xi(\frac{B_t}{Y_t}) Y_t$
- Profits are returned as dividends (Π_t^b), where

$$\Pi_t^b = D_t - B_t - \Xi\left(\frac{B_t}{Y_t}\right) Y_t$$

- Bank optimization implies a credit spread

$$R_{lt} = R_t \left[1 + \Xi'\left(\frac{B_t}{Y_t}\right)\right]$$

- Foreign investors break even:

$$(1 - \tau_l) R_{lt} = R_t^* \Phi\left(\frac{B_{ft}^l}{Y_t}\right)$$

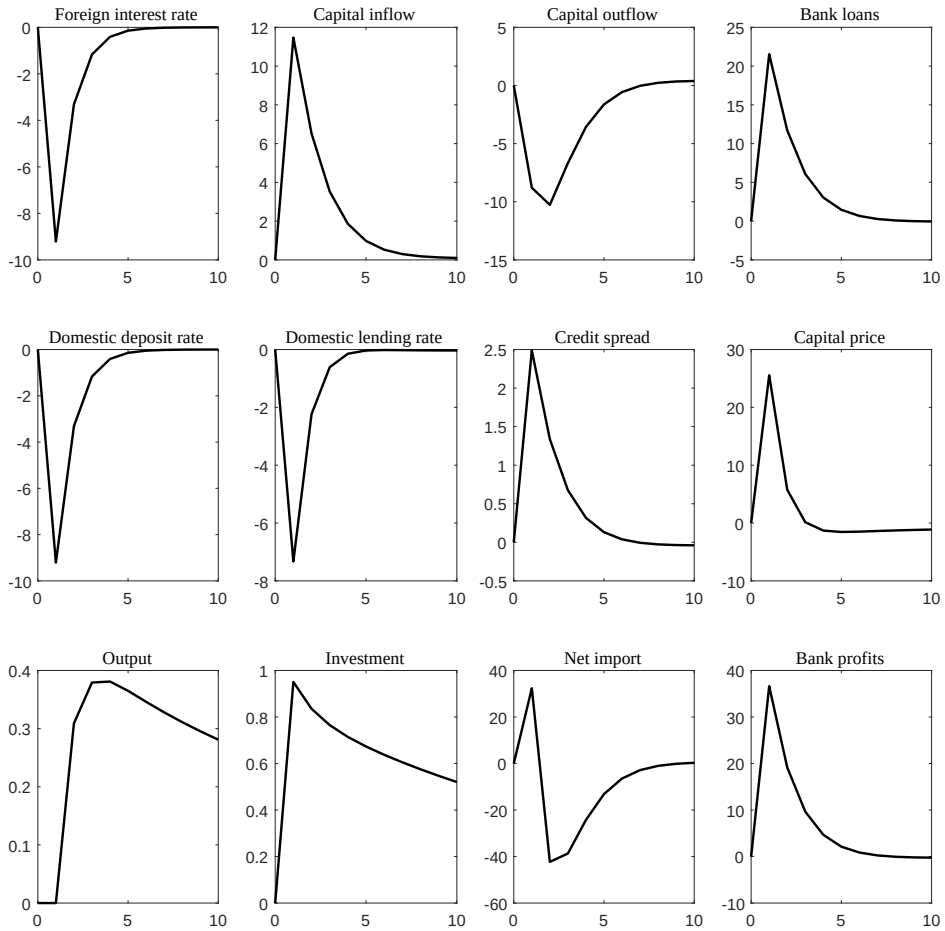
where τ_l is tax on foreign earnings and $\Phi(\cdot)$ is country risk premium

Steady state analytic results

- We set bequests and transfers to 0 to simplify
- Obtain the following results analytically:

1. $\uparrow$ inflow taxes $(\tau_l) \rightarrow \uparrow$ the interest rate (R_l) and $\downarrow$ aggregate income (Y)
2. $\uparrow$ outflow taxes $(\tau_d) \rightarrow \downarrow$ the interest rate (R_l) and $\uparrow$ aggregate income (Y)
3. $\uparrow$ in either inflow or outflow taxes $\downarrow$ the ratio of household-to-entrepreneur capital income, exacerbating income inequality

SR dynamics following temporary decline in R^*



- R_l declines, raising q^k, and stimulating I and Y
- Outflows also decline, lowering R, hurting households
- Inflows increase, while outflows decrease, raising income inequality

SR empirical implications

- Model predictions:
  1. Shocks that increase capital inflows raise inequality (E benefits more than H)
  2. Shocks that increase outflows reduce inequality
  3. Sensitivity to flows may depend on savings rate and labor income share
- We take these SR predictions to the data

Cross-country empirics

- 87 EMEs from 2002-2018
  1. Income distribution measured by GINI coefficient
  2. Private capital flows from Lane and Milesi-Ferretti (updated)
  3. Exclude OFCs
- Endogeneity an issue
  1. IV with 2-year treasury interacted with distance to NYC as first instrument
  2. Need 2 instruments for both inflows and outflows; also use 3 regional dummies, ASIA, AFRICA, and WESTHEM
- Also include battery of conditioning variables in 2nd stage
- Standard errors clustered by year

Baseline specification

- Baseline specification

$$GGINI_{i,t} = c + \beta_1 PINFLOWS_{i,t} + \beta_2 POUTFLOWS_{i,t} + \beta X_{i,t} + \theta_t + \epsilon_{i,t}$$

  - *GGINI*: YoY changes in Gini coefficients (YoY changes)
  - *PINFLOWS*: (Δ national liabilities $-$ gov. borrowing)/GDP
  - *POUTFLOWS*: (Δ national assets $-$ Δ official reserves)/GDP
  - $X_{i,t}$ is vector of conditioning variables: *CAPOPEN*, *TRDOPEN*, *LOWCORR*, *GDPCAP*, *POP*

- Also consider a specification with *net* private inflows alone

Baseline regression results

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
PINFLOWS	0.107***		0.083***		0.116***	
	(0.042)		(0.028)		(0.026)	
POUTFLOWS	-0.263***		-0.315***		-0.338***	
	(0.100)		(0.056)		(0.109)	
NPINFLOWS		0.141***		0.086***		0.112***
		(0.031)		(0.024)		(0.023)
Observations	968	968	1,165	1,165	968	968
CLR	12.76	12.12	14.00	13.60	13.07	12.37
P-value	0.01	0.01	0.01	0.01	0.01	0.01

- One std ↑ in gross inflows raises Gini by 1.35 percentage pts
- One std ↑ in gross outflows reduces Gini by 1.56 percentage pts
- One std ↑ in net inflows raises Gini by 1.80 percentage pts
- Conditioning variable coefficients in paper
- Similar results with conditioning variables dropped
  - Col (3) and (4)) full sample (1,165 obs)
  - Col (5) and (6) baseline sample (968 obs)

Optimal policy following persistent decline in R^*

	Benchmark policy	Optimal inflow tax			Optimal outflow tax		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ω (weight on H)	0.5	0.3	0.5	0.7	0.3	0.5	0.7
	Optimal capital flow tax rates						
τ_{l1}	10.17%	15.35%	18.43%	20.69%	-	-	-
τ_{l2}	10.17%	27.07%	22.60%	19.16%	-	-	-
τ_{d1}	1.64%	-	-	-	22.81%	8.68%	−30.98%
τ_{d2}	1.64%	-	-	-	10.07%	1.74%	−27.27%

- Allow planner to choose optimal 1st pd taxes, τ_{l1}, τ_{d1}, and 2nd set of tax rates for all pds after first, τ_{l2}, τ_{d2},
- Inflow taxes
  - Planner $\uparrow$ SR tax τ_{l1}; $\uparrow \omega$ leads to stronger tightening
  - LR tax τ_{l2} also $\uparrow$, $\uparrow \omega$ leads to weaker tightening
- Outflow taxes
  - Optimal SR outflow tax τ_{d1} $\uparrow$, $\downarrow$ domestic rates and $\uparrow$ loan demand.
  - Base case $\omega = 0.5$: LR outflow tax τ_{d2} much lower than τ_{d1}

Conclusion

- In a small open economy with heterogeneous agents and financial frictions, capital account liberalization impacts income distribution
- In the long run, permanent reductions in taxes on both inflows and outflows raise household income share and reduce inequality
- In the short run, changes in inflows and outflows have opposite effects on inequality: inflows raise inequality but outflows reduce it
  - Temporary declines in world interest rate lead to surges in inflows, skewing distribution in favor of entrepreneurs
  - Tightening inflow restrictions mitigates this effect
- Model's predictions about short-run effects of capital flows on income inequality are supported by data.