

# Redrawing the Map of Global Capital Flows: The Role of Cross-Border Financing and Tax Havens

Antonio Coppola  
Harvard

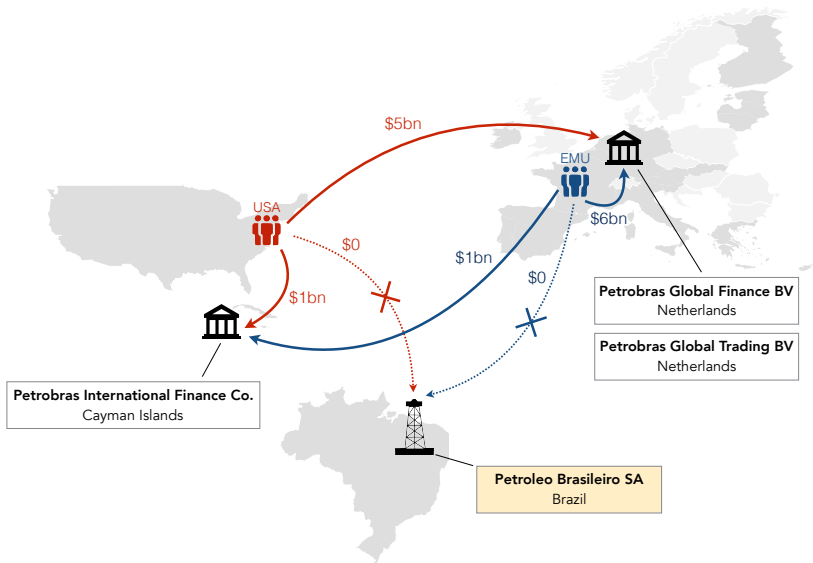
Matteo Maggiori  
Stanford

Brent Neiman  
Chicago

Jesse Schreger  
Columbia

February 2020

# How Petrobras Raises Capital From Developed Countries



## Example: Petrobras Bond (CUSIP 71645WAR2)

- ▶ \$2.7 Billion, coupon of 5.375%, 10-year, issued January 2011
- ▶ Immediate issuer: Petrobras Int. Fin. Co., Cayman Islands
- ▶ National statistics: bond from **Cayman Islands, finance/bank**
- ▶ Our procedure (downloadable): combine info from 7 commercial sources, exploit chains within and across datasets, majority and priority rules, and penalize tax havens
- ▶ Our statistics & analysis: Petroleo Brasileiro SA, **Brazil, energy**

## How Big A Deal is This?

- ▶ TH's account for  $> 10\%$  of all cross-border portfolio flows. 14% of US foreign portfolio holdings are in Cayman Islands!
- ▶ TH issuances account for  $\approx 10\%$  of all corporate financing, and nearly 50% of all cross-border issuances!
- ▶ For some emerging markets, *nearly all* of corporate sector's debt financing from developed markets flows through THs
- ▶ Rapid growth since at least 2005

# Takeaways

- ▶ Increasingly hard to see true exposures in data. Best example: US holdings of CHN securities underestimated by \$600 billion
- ▶ Changes map of global capital flows:
  - ▶ North-to-South flows much larger
  - ▶ Corporate bonds (and foreign currency) more important
  - ▶ Some “foreign” investment should be considered domestic
- ▶ Due to TH issuance, China's official NFA is twice true value

## Related Literature

- ▶ **Tax Havens, Firm Capital Structure:** Hines, Rice (1994); Desai, Foley, Hines (2005); Huizinga, Laeven, Nicodeme (2008); Zucman (2013, 15); Fuertes, Serena (2016); Hanlon, Maydew, Thornock (2015); Bilicka (2019); Guvenen, Mataloni, Rassier, Ruhl (2019)
- ▶ **Effect of FDI:** Holmes, McGrattan, Prescott (2015); Blanchard, Acalin (2016); Horn, Reinhart, Trebesch (2019)
- ▶ **Global Imbalances and China's NFA:** Bernanke (2005), Caballero, Farhi, and Gourinchas (2008), Mendoza, Quadrini, Rios-Rull (2009), Maggiori (2017)
- ▶ **Bilateral Capital Flows:** Portes, Rey (2005); Lane, Milesi-Ferretti (2001, 2018); Lane, Shambaugh (2010); Forbes (2010); Gourinchas, Jeanne (2013); Koijen, Yogo (2019)
- ▶ **Statistical Agencies:** Avdjiev, Everett, Lane, Shin (2018); Bertaut, Bressler, Curcuru (2019); Damgaard et al. (2019)

## Why Issue in Tax Havens?

1. Avoid taxation (corporate and investor)
2. Avoid capital controls
3. Avoid regulation
4. Access a different investor base

# Agenda

- ▶ Residency, Nationality, and Methodology
- ▶ A New Map of Global Capital Flows
  - ▶ Restatement of TIC and CPIS
  - ▶ North-to-South Flows Are Much Larger
  - ▶ Increasing Importance of Corporate Bond Flows
  - ▶ Spurious Foreign Investment
- ▶ Implications of Chinese Offshore Issuance
  - ▶ VIEs and their Risks
  - ▶ China's International Investment Position



## Residency-based vs. Nationality-based Statistics

- ▶ Official statistics are based on **Residency**, where country reflects location of incorporation of immediate issuer.
- ▶ Economic reality closer to **Nationality** basis, where country reflects the location of ultimate parent or operational HQ.
- ▶ **Residency** = **Nationality**:
  - ▶ Non-US governments issue USD bonds in New York (Brazil)
  - ▶ American (Global) Depository Receipts (ADRs)
- ▶ **Nationality**  $\overset{?}{\succ\prec}$  **Residency**
  - ▶ Issue through foreign operating subsidiary (Toyota Motors NA)
  - ▶ Dual listings: Companies listed in multiple countries
- ▶ **Nationality**  $\succ$  **Residency**
  - ▶ Issue in THs through foreign shell-company (Petrobras)
  - ▶ Tax inversions to THs (Medtronic)

## Aggregate Each Security to Ultimate Parent Company

- ▶ Combine information from CGS, Morningstar, Factset, Dealogic, SDC, CIQ, and Orbis
- ▶ Greater than the sum of parts: Imagine A connected to B in one source and B connected to C in another
- ▶ Country reported by PMs contains useful information
- ▶ Human intelligence (our own) for Hong Kong and Luxembourg
- ▶ Our algorithm is available online for download. Is transparent, replicable, and adaptable.

# Issuer-Level Reallocations: Examples

## Reallocations Away from Cayman Islands

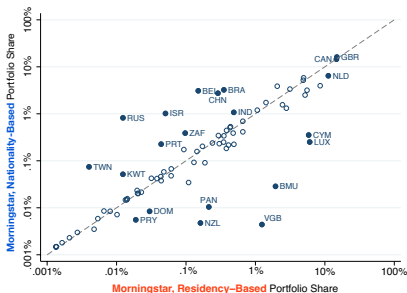
Issuer CUSIP6	Issuer Name	Issuer Residency	Parent CUSIP6	Parent Nationality	Parent Name	Value Outstanding (USD Billions)
<i>A. Corporate bonds reallocated away from country</i>						
91911T	VALE OVERSEAS LTD	CYM	P96620	BRA	VALE SA	12.3
01609W	ALIBABA GROUP HLDG LTD	CYM	01609W	CHN	ALIBABA GROUP HLDG LTD	10.3
71645W	PETROBRAS INTL FIN CO	CYM	P78331	BRA	PETROLEO BRASILEIRO SA	9.2
G2119W	CHINA EVERGRANDE GROUP	CYM	16891Y	CHN	CHINA EVERGRANDE GROUP	8.6
G4937M	IPIC GMTN LIMITED	CYM	46017L	UAE	IPIC	5.8
<i>B. Equities reallocated away from country</i>						
G87572	TENCENT HLDGS LTD	CYM	G87572	CHN	TENCENT HLDGS LTD	493.3
01609W	ALIBABA GROUP HLDG LTD	CYM	01609W	CHN	ALIBABA GROUP HLDG LTD	441.6
056752	BAIDU INC	CYM	056752	CHN	BAIDU INC	64.2
47215P	JD COM INC	CYM	47215P	CHN	JD COM INC	49.4
64110W	NETEASE INC	CYM	64110W	CHN	NETEASE INC	45.6

## Merge with MNS Portfolio Holdings Data

- ▶ **Residency**-to-**Nationality** mapping based on securities *issuance*
- ▶ Merge with Morningstar data on global fund *positions* developed in Maggiori, Neiman, Schreger (*JPE*, 2019)
- ▶ Funds account for roughly 50 percent of US external assets
- ▶ See how investment patterns in MNS change from **Residency** to **Nationality** and apply same changes to official statistics

# US Positions in Morningstar, Residency vs. Nationality

- ▶ Corporate Bonds: BRA, CHN, IND, ISR, and RUS issue via CYM, BMU, PAN, VGB
- ▶ Equities: CHN, PER (and USA ... not shown) issue via CYM, BMU, IRL, and LUX



(a) USA, Corporate Bonds



(b) USA, Equities

## Reallocation Matrices

What share of investments in each country on residency basis go to others when on a nationality basis? (*rows sum to 100%*):

Share Reallocated To:							
Destination	BRA	CHN	CYM	GBR	LUX	USA	RoW
<b>BRA</b>	100.0						
<b>CHN</b>		99.2		0.8			
<b>CYM</b>	20.1	33.0	1.4	3.5		13.3	28.7
<b>GBR</b>	0.2			86.5		4.0	9.3
<b>LUX</b>	4.7	0.1		1.5	4.4	44.8	44.5
<b>USA</b>	0.3	0.1		1.3		92.3	6.0

*Reallocation Matrix for US Corporate Debt Investments (Sample)*

## Reallocation Matrices

What share of investments in each country on residency basis go to others when on a nationality basis? (*rows sum to 100%*):

		Share Reallocated To:					
Destination	BRA	CHN	CYM	GBR	LUX	USA	RoW
BRA	100.0						
CHN		99.2		0.8			
CYM	20.1	33.0	1.4	3.5		13.3	28.7
GBR	0.2			86.5		4.0	9.3
LUX	4.7	0.1		1.5	4.4	44.8	44.5
USA	0.3	0.1		1.3		92.3	6.0

*Reallocation Matrix for US Corporate Debt Investments (Sample)*

## Reallocation Matrices

What share of investments in each country on residency basis go to others when on a nationality basis? (*rows sum to 100%*):

Destination	Share Reallocated To:						RoW
	BRA	CHN	CYM	GBR	LUX	USA	
BRA	100.0						
CHN		99.2		0.8			
<b>CYM</b>	<b>20.1</b>	33.0	1.4	3.5		13.3	28.7
GBR	0.2			86.5		4.0	9.3
LUX	4.7	0.1		1.5	4.4	44.8	44.5
USA	0.3	0.1		1.3		92.3	6.0

*Reallocation Matrix for US Corporate Debt Investments (Sample)*



## Reallocation Matrices

What share of investments in each country on residency basis go to others when on a nationality basis? (*rows sum to 100%*):

		Share Reallocated To:					
Destination	BRA	CHN	CYM	GBR	LUX	USA	RoW
BRA	100.0						
CHN		99.2		0.8			
<b>CYM</b>	20.1	<b>33.0</b>	1.4	3.5		13.3	28.7
GBR	0.2			86.5		4.0	9.3
LUX	4.7	0.1		1.5	4.4	44.8	44.5
USA	0.3	0.1		1.3		92.3	6.0

*Reallocation Matrix for US Corporate Debt Investments (Sample)*

## Reallocation Matrices

What share of investments in each country on residency basis go to others when on a nationality basis? (*rows sum to 100%*):

Share Reallocated To:							
Destination	BRA	CHN	CYM	GBR	LUX	USA	RoW
BRA	100.0						
CHN		99.2		0.8			
<b>CYM</b>	20.1	33.0	1.4	3.5		<b>13.3</b>	28.7
GBR	0.2			86.5		4.0	9.3
LUX	4.7	0.1		1.5	4.4	44.8	44.5
USA	0.3	0.1		1.3		92.3	6.0

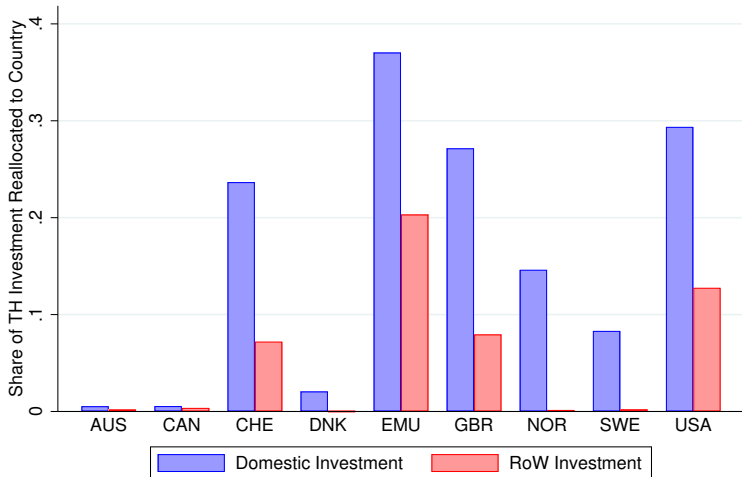
*Reallocation Matrix for US Corporate Debt Investments (Sample)*

## Reallocation Matrices

- ▶ Nine countries (AUS, CAN, CHE, DNK, EMU, GBR, NOR, SWE, and USA)
- ▶ Annual matrices for 2007-2017
- ▶ Separate matrices for equities, corporate bonds, and all bonds
- ▶ Full nationality-based reallocation or tax haven only

# Can't Use Issuance Data Alone: Country Portfolios Differ!

“Home Bias in Tax Havens” for Bonds



# Agenda

- ▶ Residency, Nationality, and Methodology
- ▶ A New Map of Global Capital Flows
  - ▶ Restatement of TIC and CPIS
  - ▶ North-to-South Flows Are Much Larger
  - ▶ Increasing Importance of Corporate Bond Flows
  - ▶ Spurious Foreign Investment
- ▶ Implications of Chinese Offshore Issuance
  - ▶ VIEs and their Risks
  - ▶ China's International Investment Position

## Restating National Statistics

- ▶ With reallocation matrices, can transform residency-based datasets into nationality-based measures
- ▶ Key assumption: reallocation matrices, made from data on funds, representative of total investment for each bilateral
- ▶ Apply to two residency-based datasets: TIC and CPIS

## Restating TIC for the US: Corporate Debt

Destination	TIC	Tax Haven Only		Full Nationality	
		Position	$\Delta$	Position	$\Delta$
Brazil	8	50	42	68	59
Bermuda	30	0	-30	0	-30
Cayman Islands	80	1	-79	1	-79
China	3	47	44	55	52
Hong Kong	8	7	-1	9	0
India	6	6	1	21	15
Ireland	63	24	-39	40	-23
Luxembourg	72	3	-69	3	-69
Russia	0	12	12	12	12
United States	5,247*	5,352	104	4,976	-271

## Restating TIC for the US: Equity

Destination	TIC	Tax Haven Only		Full Nationality	
		Position	$\Delta$	Position	$\Delta$
Brazil	119	120	1	107	-13
Bermuda	195	1	-194	1	-194
Cayman Islands	547	0	-547	0	-547
China	154	694	540	694	540
Hong Kong	147	135	-11	135	-11
India	179	181	2	172	-7
Ireland	385	71	-315	71	-314
Luxembourg	33	4	-29	4	-29
Russia	55	62	7	61	7
United States	19,284*	19,810	526	19,977	693



## Restating CPIS for the EMU: Total Debt

Destination	CPIS	Tax Haven Only		Full Nationality	
		Position	Δ	Position	Δ
Brazil	50	120	71	134	85
Bermuda	23	2	-21	2	-21
Cayman Islands	95	6	-89	6	-89
China	19	92	73	107	88
Hong Kong	21	12	-8	16	-5
India	19	26	7	47	28
Russia	36	107	72	107	72
United States	1,904	2,109	206	2,092	188
EMU	8,555*	8,255	-601	8,308	-554

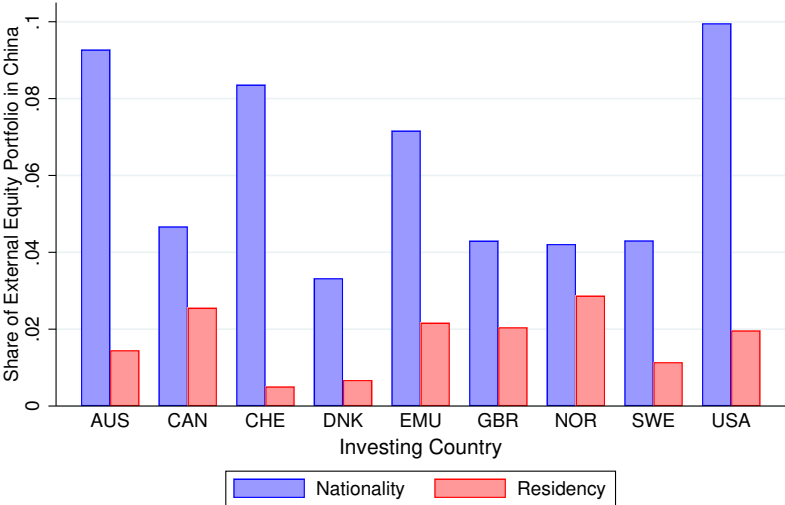
## Restating CPIS for the EMU: Equity

Destination	CPIS	Tax Haven Only		Full Nationality	
		Position	$\Delta$	Position	$\Delta$
Brazil	53	54	0	46	-7
Bermuda	38	1	-37	1	-37
Cayman Islands	223	0	-223	0	-223
China	96	331	235	329	233
Hong Kong	64	48	-16	49	-16
India	85	85	0	85	-1
Russia	47	48	1	47	0
United States	1,708	2,035	326	2,064	356
EMU	4,761*	4,357	-404	4,405	-356

# Agenda

- ▶ Residency, Nationality, and Methodology
- ▶ A New Map of Global Capital Flows
  - ▶ Restatement of TIC and CPIS
  - ▶ North-to-South Flows Are Much Larger
  - ▶ Increasing Importance of Corporate Bond Flows
  - ▶ Spurious Foreign Investment
- ▶ Implications of Chinese Offshore Issuance
  - ▶ VIEs and their Risks
  - ▶ China's International Investment Position

# North to South Flows: Chinese Equity



# North to South Flows: BRICS Debt



## Surge in North-to-South Flows

- ▶ AE investment in large EMs *much* larger than thought
  - ▶ US invests 68bn in Brazilian corporate debt, not 8bn
  - ▶ US invests 694bn in Chinese equity, not 157bn
  - ▶ UK invests 98bn in Chinese equity, not 48bn
  - ▶ EMU invests 107bn in Russian debt, not 36bn
- ▶ Implications for voluminous gravity literature (and anything that uses CPIS!)

# Agenda

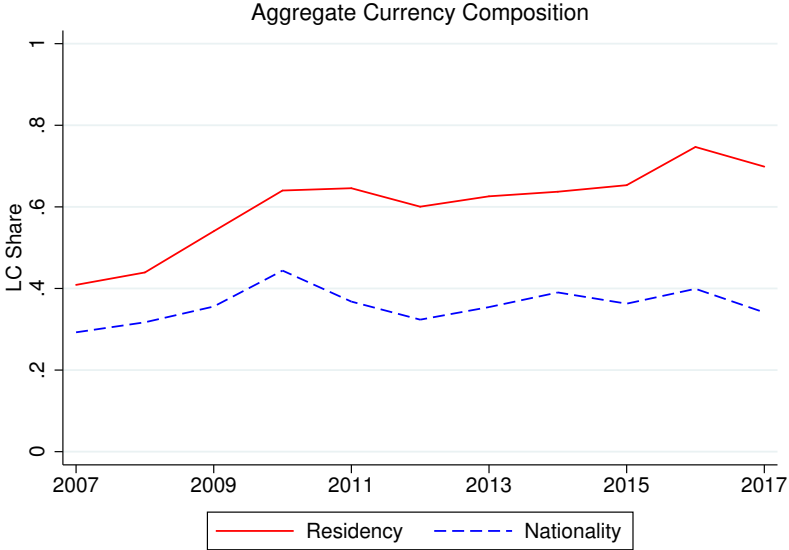
- ▶ Residency, Nationality, and Methodology
- ▶ A New Map of Global Capital Flows
  - ▶ Restatement of TIC and CPIS
  - ▶ North-to-South Flows Are Much Larger
  - ▶ Increasing Importance of Corporate Bond Flows
  - ▶ Spurious Foreign Investment
- ▶ Implications of Chinese Offshore Issuance
  - ▶ VIEs and their Risks
  - ▶ China's International Investment Position

## Corporate Borrowing More Important

- ▶ Corporate debt surges in importance relative to sovereign debt
  - ▶ US investment in Brazilian bonds that is corp is 70%, not 25%
  - ▶ US investment in Russian bonds that is corp is 50%, not 0%
  - ▶ UK bond positions jump in key EMs due to offshore corporates (60% for Brazil, 75% for China, and 150% for Russia)
- ▶ Nearly all these offshore issuances are *not* in local currency
- ▶ Implications for currency composition of external debt



# Currency Composition of Brazil's External Debt



# Agenda

- ▶ Residency, Nationality, and Methodology
- ▶ A New Map of Global Capital Flows
  - ▶ Restatement of TIC and CPIS
  - ▶ North-to-South Flows Are Much Larger
  - ▶ Increasing Importance of Corporate Bond Flows
  - ▶ Spurious Foreign Investment
- ▶ Implications of Chinese Offshore Issuance
  - ▶ VIEs and their Risks
  - ▶ China's International Investment Position

# Spurious Foreign Investment

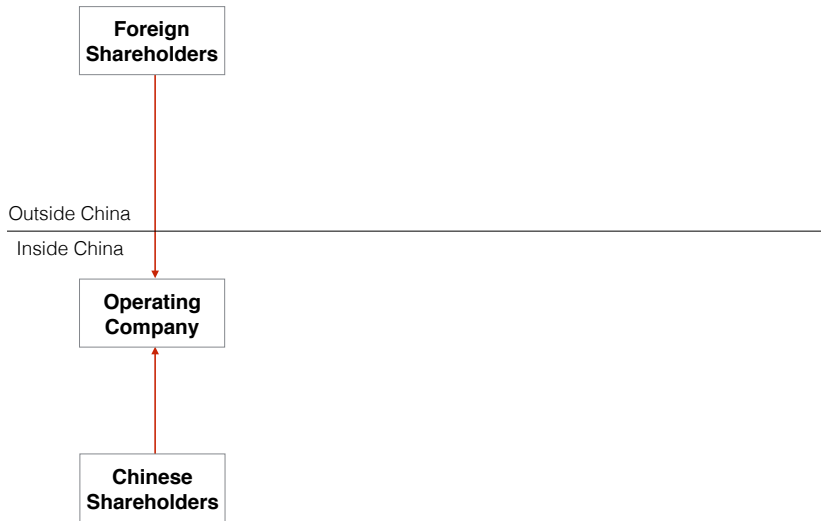
- ▶ Some reclassifications send the positions back to the investors' countries – foreign investment that isn't really foreign!
- ▶ Huge for U.S., moderate for U.K., small elsewhere.
- ▶ Key drivers:
  - ▶ CLOs backed by U.S. loans, resident in Cayman Islands (Liu and Schmidt-Eisenlohr, 2019)
  - ▶ Irish tax inversions (famous case: Medtronic)
  - ▶ U.K. regional water suppliers (Thames Water, etc.)

# Agenda

- ▶ Residency, Nationality, and Methodology
- ▶ A New Map of Global Capital Flows
  - ▶ Restatement of TIC and CPIS
  - ▶ North-to-South Flows Are Much Larger
  - ▶ Increasing Importance of Corporate Bond Flows
  - ▶ Spurious Foreign Investment
- ▶ Implications of Chinese Offshore Issuance
  - ▶ VIEs and their Risks
  - ▶ China's International Investment Position

# Standard vs. VIE Structure

## Standard Structure



# Standard vs. VIE Structure

Standard Structure

**Foreign Shareholders**



**Operating Company**

**Chinese Shareholders**



VIE Structure

**Foreign Shareholders**



**Listed Company**



**SPV**



**Operating Company**



**WFOE**

**Chinese Owners**

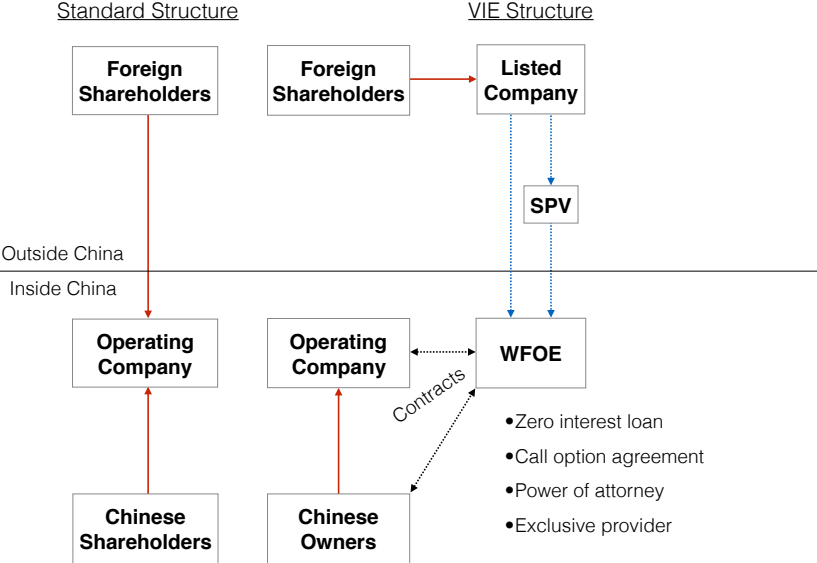


Outside China

Inside China



# Standard vs. VIE Structure



# Shaky Exposure to Chinese VIEs Larger Than Thought

- ▶ Value of VIEs super risky due to government enforcement, punitive taxation, owner expropriation, etc. Trade war?!
- ▶ We didn't identify the risk. We just think it's *much* bigger.
- ▶ Alibaba's prospectus for IPO on NYSE (SEC Form F-1):

*"If the [Chinese] government deems that the contractual arrangements in relation to our variable interest entities do not comply with [Chinese] governmental restrictions on foreign investment, or if these regulations or the interpretation of existing regulations changes in the future, we could be subject to penalties or be forced to relinquish our interests in those operations."*



# Agenda

- ▶ Residency, Nationality, and Methodology
- ▶ A New Map of Global Capital Flows
  - ▶ Restatement of TIC and CPIS
  - ▶ North-to-South Flows Are Much Larger
  - ▶ Increasing Importance of Corporate Bond Flows
  - ▶ Spurious Foreign Investment
- ▶ Implications of Chinese Offshore Issuance
  - ▶ VIEs and their Risks
  - ▶ China's International Investment Position

## Implications for China's Net Foreign Assets (NFA)

- ▶ Net Foreign Asset Position (*NFA*) captures net claims on RoW:

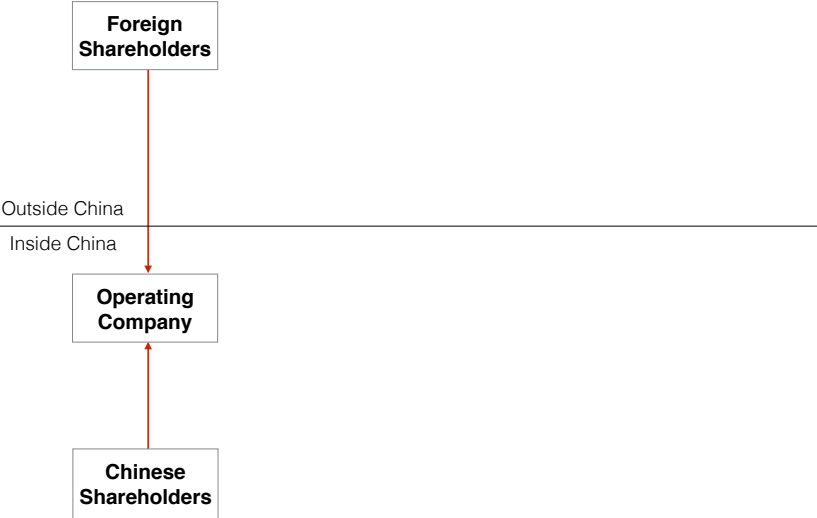
$$NFA = A - L$$

$$\Delta NFA = CA + \text{Valuation Changes}$$

- ▶ China's large positive NFA is 2nd/3rd largest (with Germany) and is major contributor to *global imbalances*
- ▶ But *L* may be too small if, due to offshore issuance, liabilities associated with VIEs not linked to value of listed company
- ▶ China's true NFA may be half of official value, and more like Norway, Switzerland, or Singapore

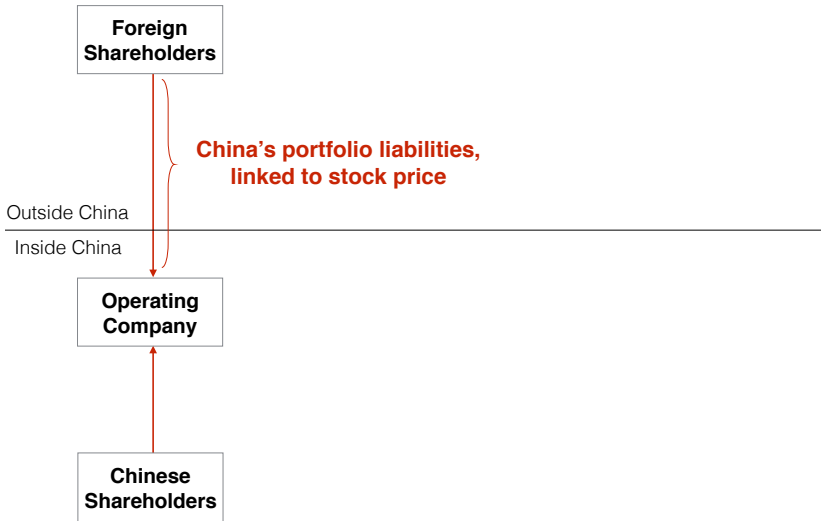
# Implications for China's NFA: What's the Benchmark?

## Standard Structure

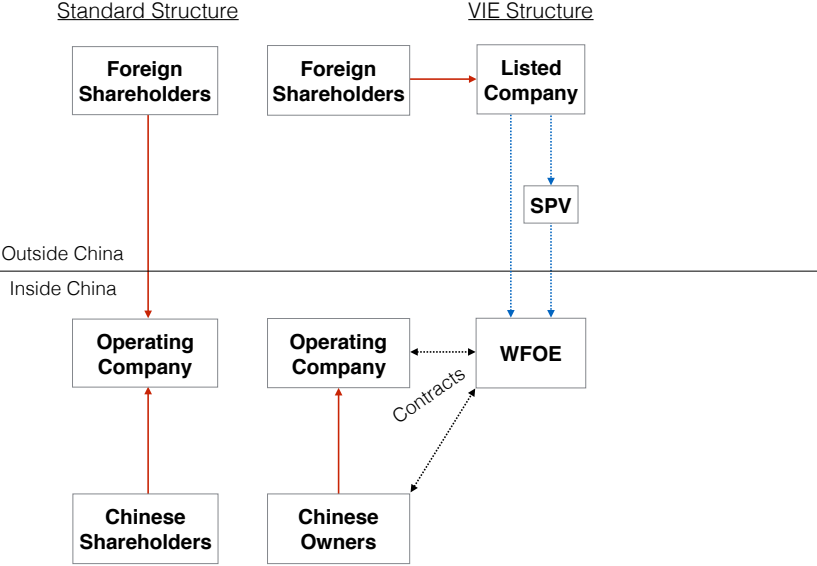


# Implications for China's NFA: What's the Benchmark?

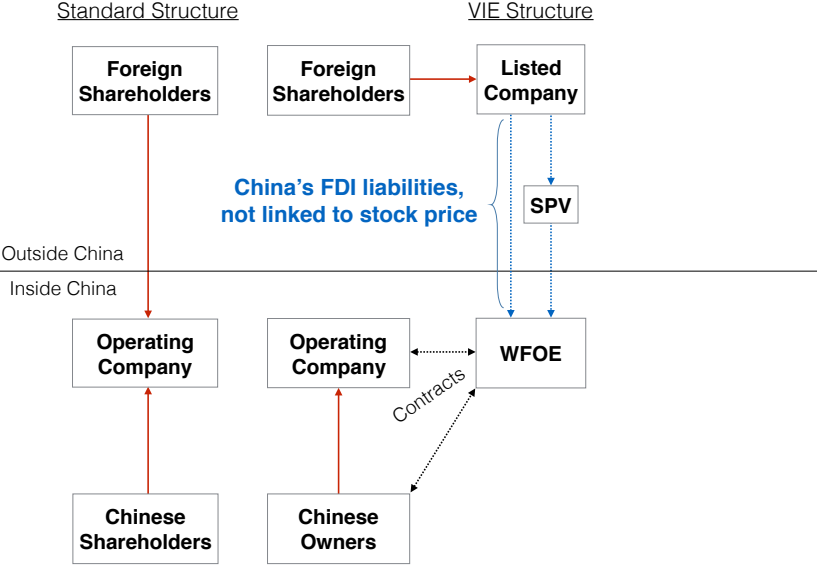
## Standard Structure



# Implications for China's NFA: What's the Benchmark?

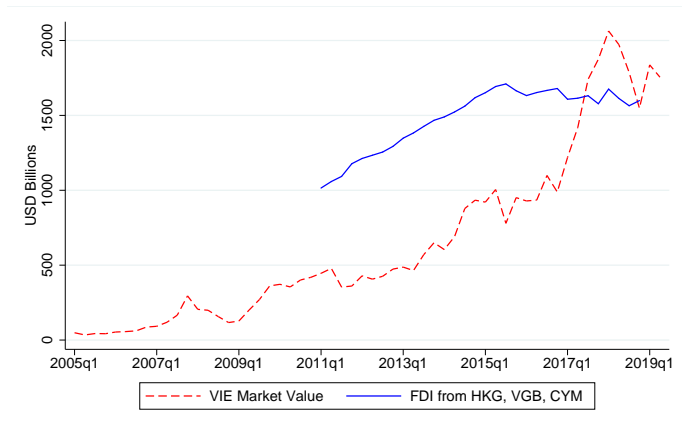


# Implications for China's NFA: What's the Benchmark?



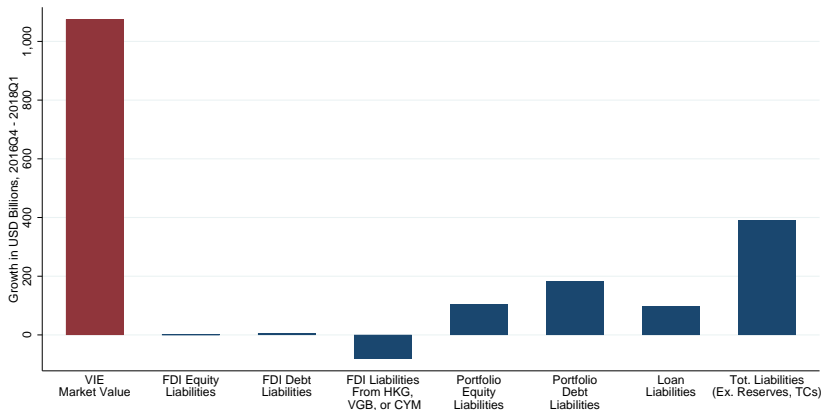
## Does VIE Structure Result in Mismeasurement of NFA?

- Unclear exactly how positions associated with VIEs are booked. But they do not appear linked to listed company market values.



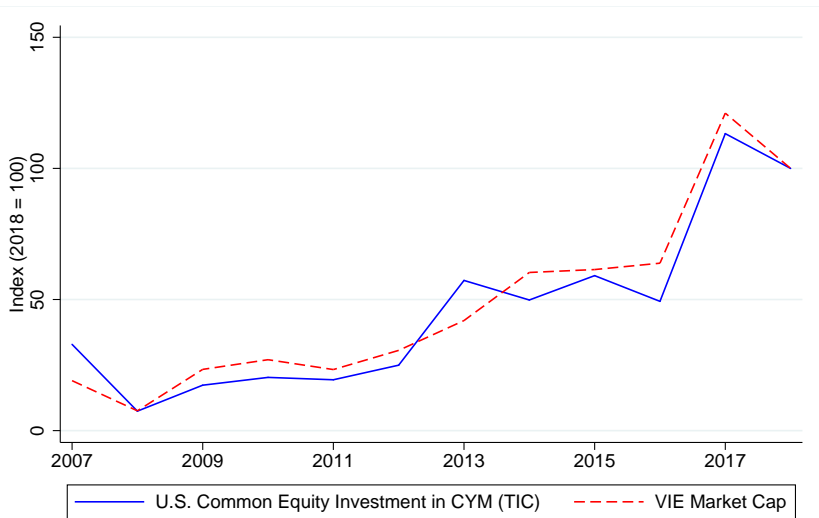
# Might the VIEs Be in Other Liabilities Categories?

- ▶ Focusing on surge in value of VIEs from 2016:Q4 to 2018:Q1:

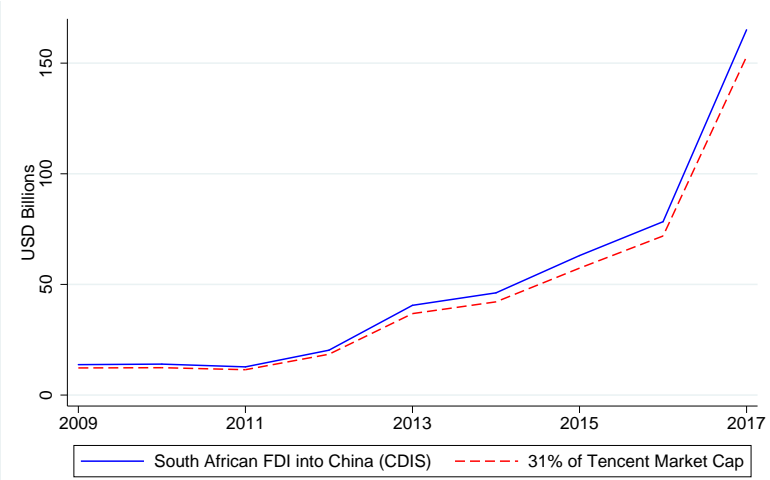




## Counterexample: USAT Common Equity Positions in CYM

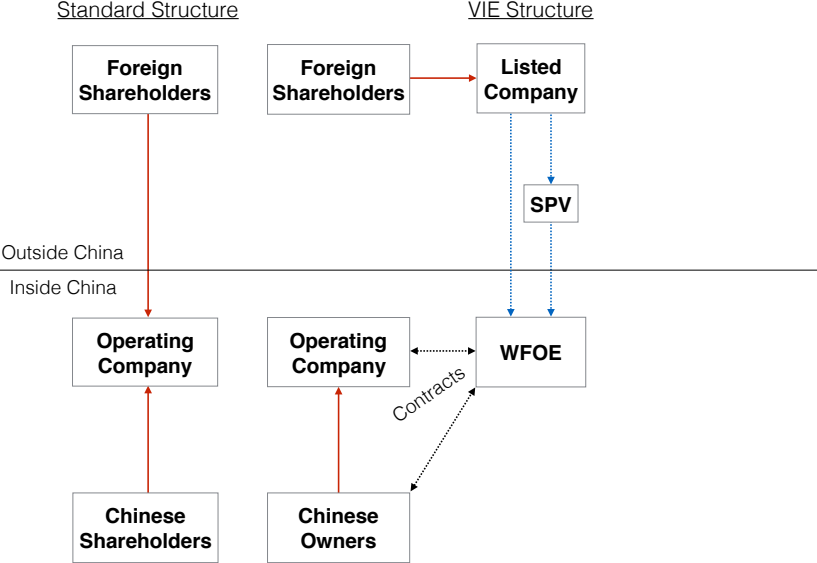


# Counterexample: ZAF FDI Positions in CHN

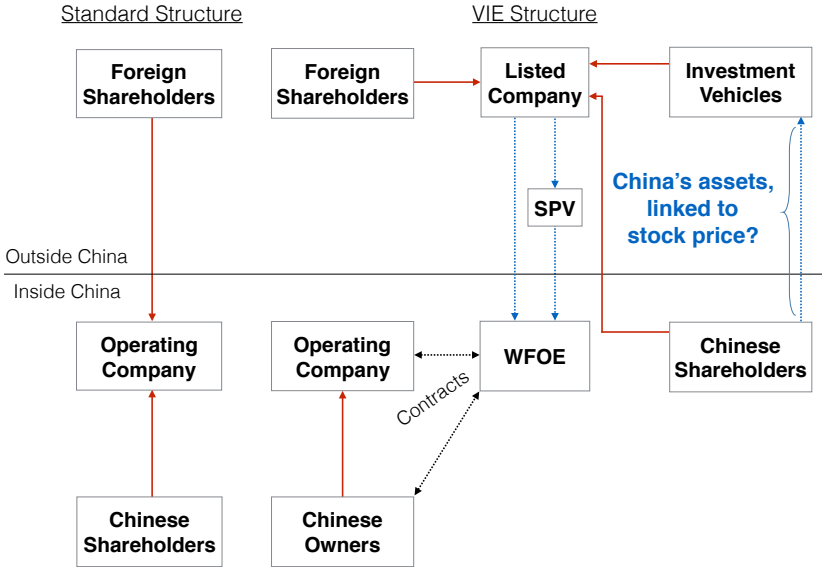


► Naspers has held constant ~ 31% share in Tencent

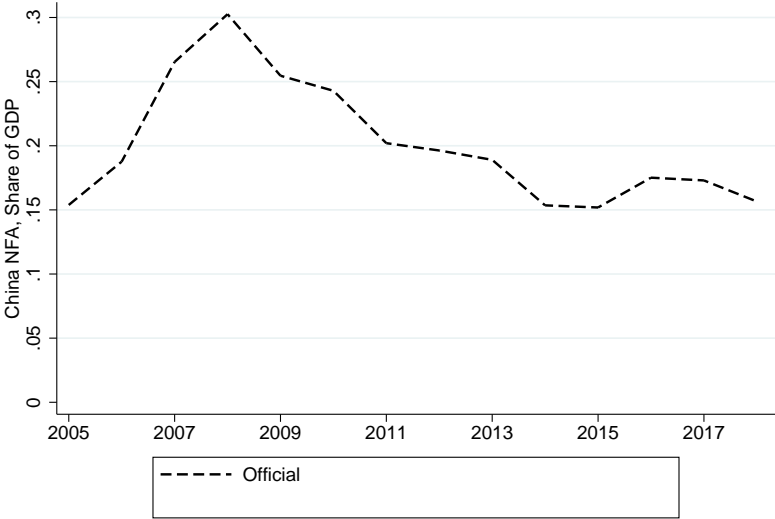
# Implications for China's NFA: Foreign Assets



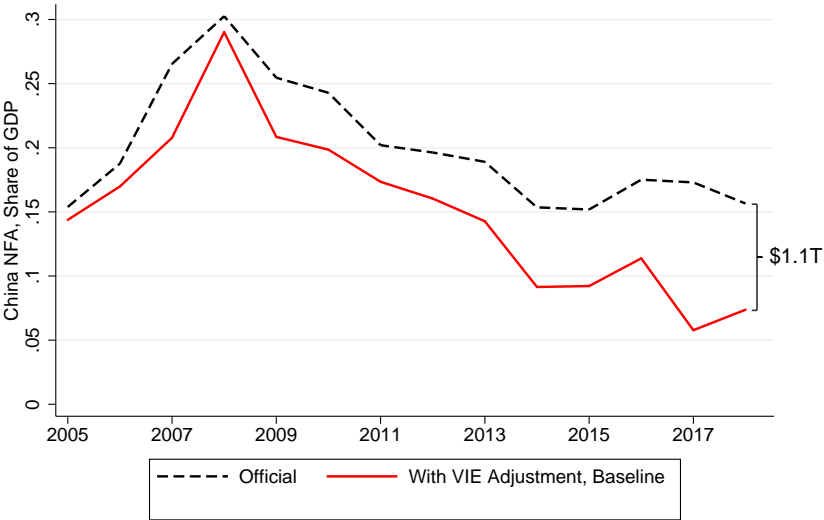
# Implications for China's NFA: Foreign Assets



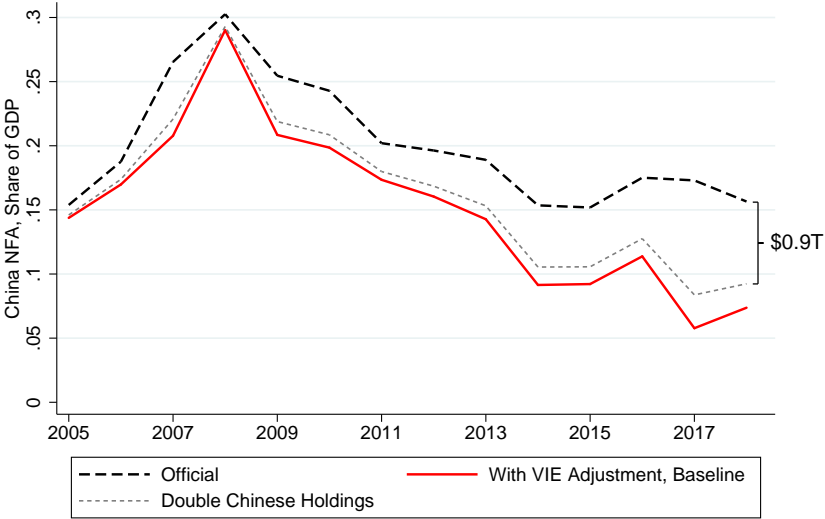
# NFA Mismeasurement is Potentially Large



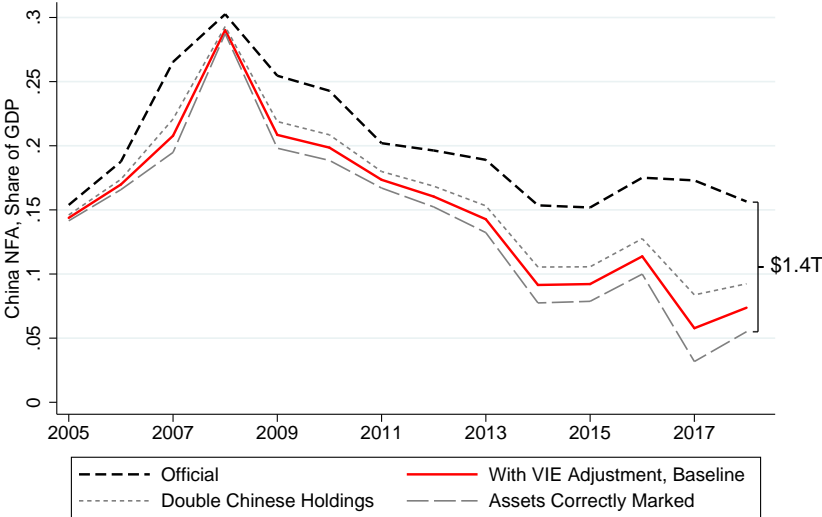
# NFA Mismeasurement is Potentially Large



# NFA Mismeasurement is Potentially Large: Robustness

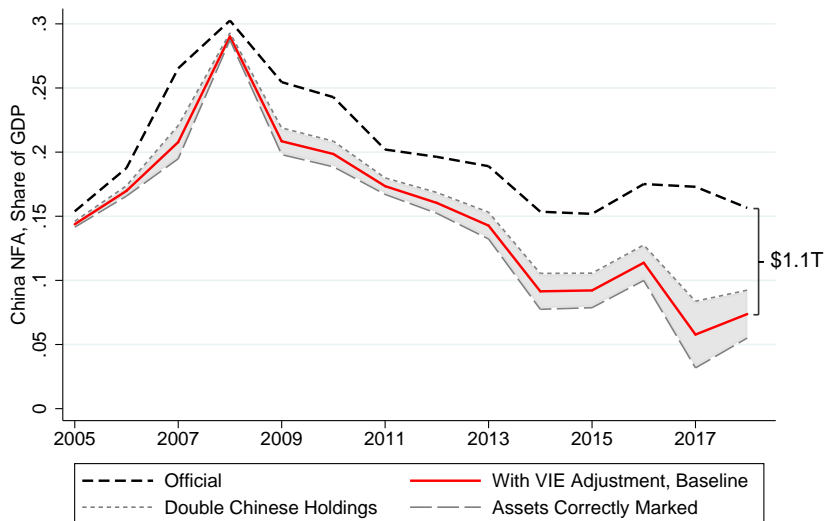


# NFA Mismeasurement is Potentially Large: Robustness





## Is China as Big a Creditor as you Think?



- ▶ *Much* more external adjustment has occurred than is thought
- ▶ Disproportionate focus on Chinese holdings of US Treasuries
- ▶ Broader conjecture on FDI (ala Blanchard-Acalin, 2016)

# Conclusion

- ▶ Novel View of Global Capital Allocations
- ▶ Methodology:
  - ▶ Algorithm for piercing veil of THs and restating capital flows
  - ▶ Provide new data and restate commonly used public datasets
- ▶ Takeaways:
  - ▶ N-to-S flows massively underestimated, biased toward govt debt
  - ▶ National statistics poorly reflect true risk exposures
  - ▶ Drives huge NFA mismeasurement in China (elsewhere?)
- ▶ Follow Global Capital Allocation Project, download data, and use codes at [www.globalcapitalallocation.com](http://www.globalcapitalallocation.com)