

# Gross Capital Flows by Banks, Corporates and Sovereigns

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# Need for data on capital flows by sector

- Capital flows are important for:
  - transmission of real and financial shocks across borders
  - the distribution of global risk
  - countries' own macroeconomic outcomes
- Extensive research on capital flows focusing data on net flows
- Recently, importance of gross flows have been realized
- Almost no work uses gross flows broken down by borrower/lender
  - Gross flows, but no sectoral breakdown
    - Forbes and Warnock(2012), Broner et al. (2013), Milesi-Ferretti and Tille(2011),and Bluedorn et al. (2013)
  - Public-Private sector breakdown, but of net flows
    - Aguiar and Amador(2011), Gourinchas and Jeanne(2013), and Alfaro et al. (2014)

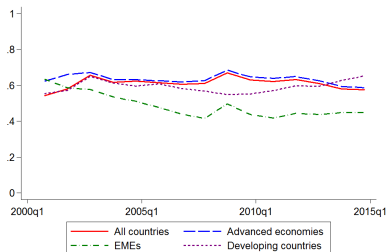
# What do we do

- Construct a dataset on gross capital **inflows**:
  - quarterly from 1996q1 to 2014q4
  - balanced panel of 85 countries: 25 AE, 34 EM, 26 DE
- Construct a dataset on gross capital **outflows**:
  - quarterly from 2004q1 to 2014q4
  - balanced panel of 31 countries: 15 AE, 16 EM
- Break down debt inflows and outflows by:
  - sovereigns (government, central bank)
  - banks
  - corporates

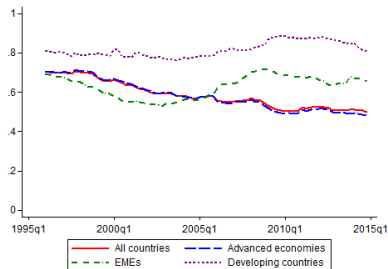
## Key Takeaways

- Inflows and outflows co-move due to banks borrowing and lending behavior.
- High VIX  $\rightarrow$  K inflows to banks, and corporates  $\downarrow$
- High VIX  $\rightarrow$  K outflows by banks, and corporates  $\downarrow$
- High VIX: no response from AE sovereign, EM sovereign: loan-bond response differ
- Banks borrow procyclically in AE and EM; corporates borrow procyclically only in EM
- EM sovereigns borrow counter-cyclically; AE sovereign borrowing is acyclical

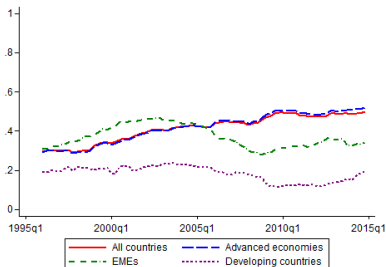
# Why decompose debt?



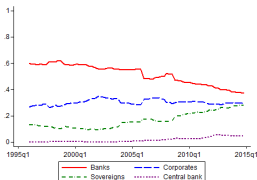
(a) Share of Debt



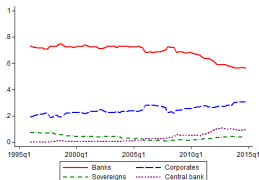
(b) Share of OID



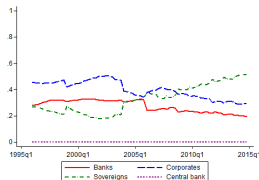
# Why decompose debt?



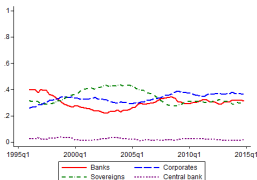
(a) Share of Sectors, AE



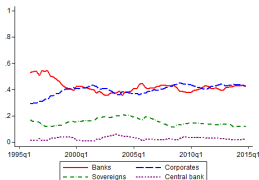
(b) Share of Sectors, OID, AE



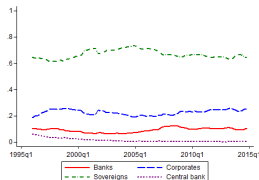
(c) Share of Sectors, PD, AE



(d) Share of Sectors, EM

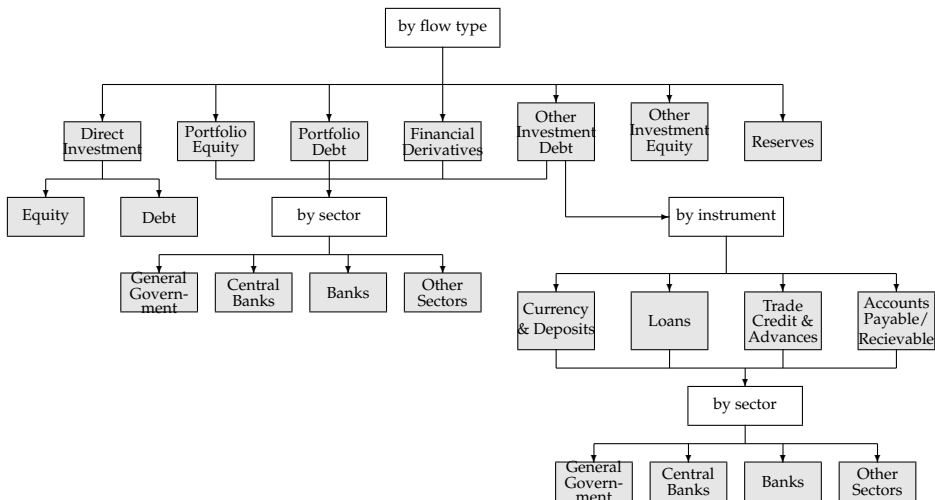


(e) Share of Sectors, OID, EM



(f) Share of Sectors, PD, EM

# Road Map for Decomposition



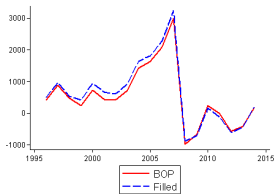
- Start with Balance of Payments, BMP6
- Internal Fill
  - When the BMP6 data covers total for a given sector and 3 out of 4 sectors we subtract from the total for the remaining sector
- External Fill (using publicly available data)
  - IMF International Investment Position (IIP) statistics
  - IMF/WB Quarterly External Debt Statistics(QEDS)
  - BIS International Debt Securities (IDS) Statistics
  - BIS International Bank Statistics (IBS)
    - BIS Locational Bank Statistics (LBS)
    - BIS Consolidated Bank Statistics(CBS)
- Cross-check with WB Debt Reporting System (DRS) data



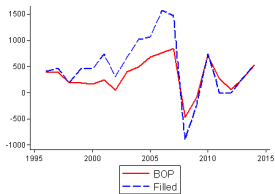
# How much we fill?

			Annual			Quarterly		
Flow	Sect.	Group	BOP	Int. Fill	Ext. Fill	BOP	Int. Fill	Ext. Fill
PD	GG	Adv.	80.6	0.0	19.4	79.4	0.0	20.6
PD	GG	Em.	82.4	0.3	17.3	74.2	0.8	25.0
PD	GG	Dev.	40.2	0.7	59.1	25.0	0.1	74.9
PD	CB	Adv.	9.5	58.3	32.2	7.5	60.5	32.0
PD	CB	Em.	23.5	40.6	35.9	19.5	35.6	44.9
PD	CB	Dev.	11.2	8.2	80.5	2.6	4.8	92.7
PD	DC	Adv.	67.6	3.6	28.8	67.7	3.4	28.8
PD	DC	Em.	61.7	4.1	34.3	55.6	3.5	40.9
PD	DC	Dev.	18.6	1.6	79.8	10.3	0.7	89.0
PD	OS	Adv.	75.4	0.0	24.6	74.7	0.0	25.3
PD	OS	Em.	69.8	2.3	28.0	64.4	1.9	33.6
PD	OS	Dev.	29.3	0.5	70.2	13.3	0.3	86.5
OID	GG	Adv.	80.0	2.1	17.9	78.4	3.2	18.4
OID	GG	Em.	93.7	0.8	5.6	88.1	0.9	11.0
OID	GG	Dev.	87.7	0.0	12.3	49.7	0.0	50.3
OID	CB	Adv.	68.2	13.9	17.9	65.8	15.4	18.7
OID	CB	Em.	87.4	6.6	6.0	79.2	9.8	11.0
OID	CB	Dev.	74.6	13.3	12.1	46.0	6.7	47.3
OID	DC	Adv.	81.9	0.0	18.1	81.4	0.0	18.6
OID	DC	Em.	94.0	0.0	6.0	89.0	0.0	11.0
OID	DC	Dev.	77.7	6.1	16.1	48.0	1.8	50.2
OID	OS	Adv.	84.0	0.4	15.6	82.8	0.1	17.2
OID	OS	Em.	94.4	0.0	5.6	89.0	0.0	11.0
OID	OS	Dev.	88.4	1.1	10.5	52.5	0.7	46.8
Balanced Sample			12	16	89	0	10	85

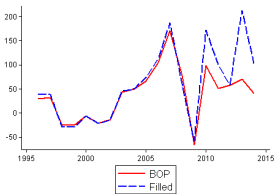
# BMP6 vs Our Data



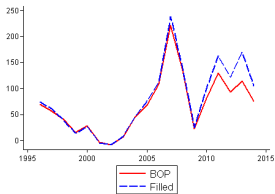
(a) AE Bank



(b) AE Corporate

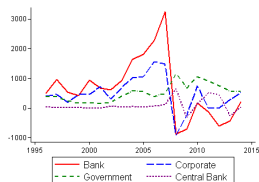


(c) EM Bank

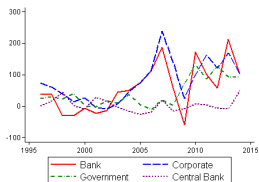


(d) EM Corporate

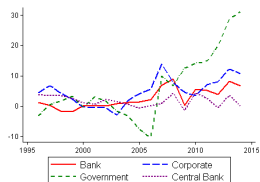
# Inflows By Sector



(a) AE

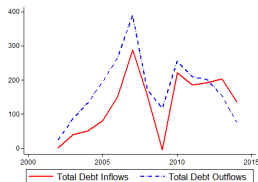


(b) EM

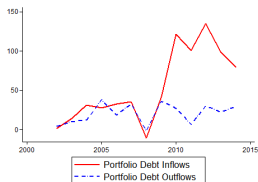


(c) Developing

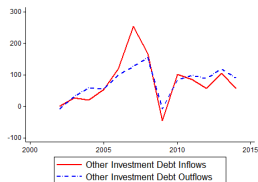
# Inflow-Outflow Co-movement in EM: I



(a) Debt Flows

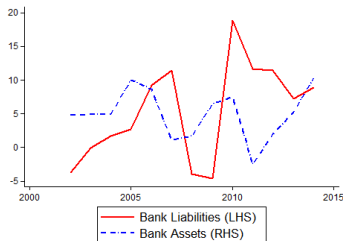


(b) Portfolio Debt Flows

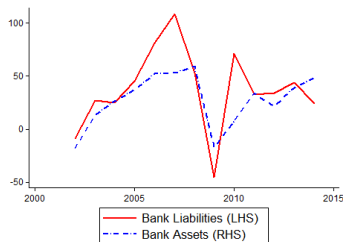


(c) Other Investment Debt Flows

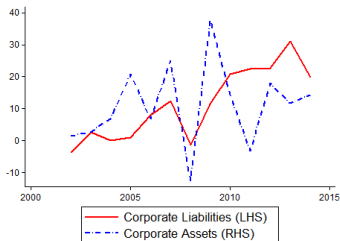
# Inflow-Outflow Co-movement in EM: II



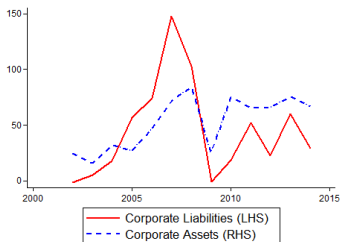
(a) Portfolio Debt, Banks



(c) Other Investment Debt, Banks



(b) Portfolio Debt, Corporates



(d) Other Investment Debt, Corporates

$$\frac{INFLOW_{it}}{GDP_{it}} = \alpha_i + \beta \log(VIX_{t-1}) + \gamma GDPGrowth_{it-1} + \epsilon_{it} \quad (1)$$

# Panel Regressions: Inflows

Panel B: Advanced Economies

	Total	Public	Banks	Corp.
$\log(\text{VIX}_{t-1})$	-9.101*** (2.676)	0.813 (1.400)	-7.630*** (2.068)	-2.284** (0.962)
$\text{GDP Growth}_{it-1}$	0.506*** (0.179)	0.0616 (0.0340)	0.363** (0.131)	0.0819 (0.0466)
Observations	1127	1127	1127	1127
$R^2$	0.065	0.002	0.056	0.026
CountryFE	Yes	Yes	Yes	Yes

Panel C: EM

	Total	Public	Banks	Corp.
$\log(\text{VIX}_{t-1})$	-2.261** (0.829)	1.077 (0.652)	-2.265*** (0.706)	-1.073*** (0.253)
$\text{GDP Growth}_{it-1}$	0.116*** (0.0347)	-0.0394*** (0.0123)	0.118*** (0.0346)	0.0381*** (0.00928)
Observations	1372	1372	1372	1372
$R^2$	0.071	0.021	0.116	0.075
CountryFE	Yes	Yes	Yes	Yes

# Panel Regressions: Outflows

Panel B: Advanced Economies

	(1)	(2)	(3)	(4)	(5)	(6)
	Total	Public	Banks	Corp.	Total + Reserves	Public + Reserves
$\log(\text{VIX}_{t-1})$	-11.61*** (3.772)	0.0888 (2.400)	-9.121** (3.233)	-2.575** (0.966)	-10.66** (3.965)	1.040 (2.606)
$\text{GDP Growth}_{it-1}$	0.339** (0.116)	0.0553 (0.0361)	0.263** (0.0969)	0.0204 (0.0230)	0.337** (0.118)	0.0533 (0.0401)
Observations	660	660	660	660	660	660
$R^2$	0.082	0.004	0.087	0.025	0.074	0.004
CountryFE	Yes	Yes	Yes	Yes	Yes	Yes

Panel C: EM

	(1)	(2)	(3)	(4)	(5)	(6)
	Total	Public	Banks	Corp.	Total + Reserves	Public + Reserves
$\log(\text{VIX}_{t-1})$	-2.223*** (0.588)	-0.813 (0.495)	-1.048*** (0.309)	-0.362** (0.152)	-2.906*** (0.831)	-1.496 (0.958)
$\text{GDP Growth}_{it-1}$	0.0387 (0.0195)	-0.00157 (0.00914)	0.0269 (0.0154)	0.0135 (0.00989)	0.0746*** (0.0234)	0.0343** (0.0159)
Observations	704	704	704	704	704	704
$R^2$	0.045	0.009	0.017	0.011	0.067	0.020
CountryFE	Yes	Yes	Yes	Yes	Yes	Yes



# Inflow-Outflow Comovement conditional on VIX, GDP: AE

Advanced economies			Inflows						Outflows						
			Public		Bank		Corp		Public			Bank		Corp	
			PD	OID	PD	OID	PD	OID	PD	OID	Res.	PD	OID	PD	OID
Inflows	Public	PD													
		OID													
	Bank	PD													
		OID													
Outflows	Public	PD													
		OID													
	Res.														
Outflows	Bank	PD													
		OID													
	Corp	PD													
		OID													

# Inflow-Outflow Comovement conditional on VIX, GDP: EM

Emerging Markets			Inflows						Outflows						
			Public		Bank		Corp		Public			Bank		Corp	
			PD	OID	PD	OID	PD	OID	PD	OID	Res.	PD	OID	PD	OID
Inflows	Public	PD													
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- We construct a new dataset on **quarterly** capital inflows and outflows decomposing flows by borrower and lender
  - 85 countries for inflows during 1996-2014; 31 countries for outflows during 2004-2014
- New facts emerge from our data and we also shed light on old facts
  - Inflows and outflows co-move due to banks
  - Public and private flows move in opposite direction in general
  - Banks are the key source of procyclicality
  - EM sovereigns are very different than AE sovereigns (both cyclical properties of borrowing and response to global shocks)