The impact of capital flow volatility on exchange rate volatility: from mitigating factors to the FX resilience measure

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Road map

- Motivation
- Research contributions
- Literature review
- Data
- Cluster analysis
- Threshold analysis and FX resilience index
- Key takeaways

Motivation

- Cross-border capital flows have increased dramatically from $11tn in 2001 to $57tn in 2019 (IMF, 2020) ➡ accompanied by an increase in the volatility of capital flows (Forbes, 2012)

- Extreme movements in capital flows ➡ excessive exchange rate volatility ➡ negative impact on economic growth and the stability of the financial sector (Giannellis and Papadopoulos, 2011; Gabaix and Maggiori, 2015)

Research contributions

- Quantify the impact of CF volatility on FX volatility across the major AEs and EMEs.
- Identify the economic factors that can significantly mitigate the adverse impact of CF volatility on FX volatility and the relevant thresholds
- Introduce an FX resilience index to assess the vulnerabilities of exchange rates in the presence of volatile capital flows

Literature review

- Theories of exchange rate determination
  - ❖ flexible-price monetary model (Mundell, 1963; Meese and Rogoff, 1983; Baxter and Stockman, 1989)
  - ❖ general portfolio balance model (Gourinchas and Rey, 2007; Lane and Milesi-Ferretti, 2004; Eichengreen and Gupta, 2015)

- Few studies focus on drivers of exchange rate volatility (Grossmann et al., 2004; Milesi-Ferretti and Tille, 2011; Guichard, 2017)

- Underlying factors that channel the impact of cross-border capital flows on the volatility of exchange rates (Jeanne and Rose, 2002; Chen, 2006; Leung and Wan, 2019; IMF, 2021;)

- The types of capital flows could also matter (Brooks and others (2004; Gabaix and Gagggiori, 2015; Caporale et al., 2017; Cesa-Bianchi et al., 2019)

Literature review

- Potential mitigating factors:
  - *Output*: real GDP growth
  - *Trade*: trade openness (total import and export)
  - *Foreign assets holdings*: FX reserve, total foreign investment (the sum of net FDI, net portfolio equities and bonds)
  - *Monetary policy stance*: short-term interest rate
  - *Leverage*: total credit to private sectors
  - *Fiscal policy*: fiscal surplus
  - *Financial development*: financial development index
  - *Exchange rate regime*: floating or non-floating exchange rate regimes

Data

- EPFR equity and bond fund flows, 20 AEs and EMEs, weekly, 01:2002 – 09:2020
- Economic variables: quarterly, IMF, WB, BIS, Datastream, Bloomberg

Data

Table 1. Breakdown of AEs and EMEs

AEs			EMEs		
Country	Has non-floating FX periods? (Yes/No)	Non-floating FX periods	Country	Has non-floating FX periods? (Yes/No)	Non-floating FX periods
Australia	No		Brazil	No	
Canada	No		Egypt	Yes	2002-2019 excl. 2016
Japan	No		India	No	
Sweden	No		Morocco	Yes	2002-2019
United Kingdom	No		Russia	Yes	2002-2013
United States	No		Chile	No	
Hong Kong	Yes	2002-2019	China	Yes	2002-2019
Singapore	Yes	2002-2019	Czech Republic	Yes	2002-2006; 2013-2016
Switzerland	No		Korea	No	
			Malaysia	Yes	2002-2007; 2009-2015
			Thailand	No	

Note: FX regime is classified as a value below 6 in the IMF Annual Report on Exchange Arrangements and Exchange Restrictions

Data

Table 2. Variables: definitions and data sources

Variables	Variables Symbols	Definitions and measures	Unit	Used of data
FX volatility	Vol_FX	Vol_FX is the S.D. of nominal effective exchange rate at weekly frequency (estimated in a 4-week rolling window) and quarterly frequency (estimated in a non-overlap quarterly window).	Index	J.P.Morgan nominal effective exchange rate index. The index measures a currency's nominal exchange rate relative to a basket of other currencies using an trade-weighted calculation.
Capital flow	CapitalFlow	Funds flow (equities and bonds) is the % change of asset under management subtracted by portforlio performance and foreign exchange rate change.	%	Equity Funds, ETFs & Mutual Funds: Portfolio Change (%); Equity Funds,ETFs & Mutual Funds: Ending Assets (EOP,Mil.US$); Bond Funds: ETFs & Mut Funds: Port Change(AVG, %) and Bond Funds: ETFs/Mut Funds: End Assets(EOP, Mil.US$). Weekly
Captital flow volatility	Vol_CF	Vol_CF is the S.D. of funds flow (equity and bond) at weekly frequency (estimated in a 4-week rolling window) and quarterly frequency (estimated in a non-overlap quarterly window).	%	The same as above.
Real GDP growth	RealGDP_Growth	Real GDP growth rate calcuated as quarterly % change.	%	Gross Domestic Product Based On Purchasing Power Parity, Standardized, Constant Prices, Seasonally Adjusted
GDP	GDP	Annual GDP	Millions, USD	GDP, PPP (current international $)
Net export	NetExport	Net export of goods and services	% of annual GDP	Current Account, Goods and Services, Net, Millions USD
Trade openness	TradeOpenness	Total export and import divided by annual GDP	% of annual GDP	Export and Import, Current Account, Goods and Services, Credit, US Dollars
FX reserve	FXReserve	FX reserve	% of annual GDP	Supplementary Items, Reserves and Related items, US Dollars
Net FDI	NetFDI	Net FDI	% of annual GDP	Financial Account, Net Lending (+) / Net Borrowing (-) (Balance from Financial Account), Direct Investment, Net Acquisition of Financial Assets, US Dollars
Net portfolio equity	NetEquity	Net equities	% of annual GDP	Financial Account, Portfolio Investment, Net Acquisition of Financial Assets, Equity and Investment Fund Shares, US Dollars
Net portfolio bond	NetBond	Net bonds	% of annual GDP	Financial Account, Portfolio Investment, Net Acquisition of Financial Assets, Debt Securities, US Dollars
Total foreign investment	TFI	The summary of net FDI, net equities and net bonds	% of annual GDP	See the definitions of Net FDI, Net portfolio equityes and Net portfolio bonds as described above.

Data

Table 2. Variables: definitions and data sources (cont.)

Variables	Variables Symbols	Definitions and measures	Unit	Used of data
Credit to private	CreditPrivate	Total credit to private sector	% of annual GDP	Total credit to the private non-financial sector (core debt)
Fiscial surplus	FiscialSurplus	Net government borrowing, lending(-)/borrowing(+).	% of annual GDP	General government net lending/borrowing, percent of fiscal year GDP (Percent of annual GDP for quarterly data)
Short-term interest rate	ShortRate	3-month money market rate or Tbill rate	%	Australia, Singapore and U.S. use 3-month money market rate (code I60B.. in Datastream, has over 95% corelation with 3-month Tbill rate). The rest of the sample counties use 3-month Tbill rate from Bloomberg.
Finanical development ind	FinanicalDevelopment	Finanical development index developed by IMF. See https://data.imf.org/?sk=F8032E80-B36C-43B1-AC26-493C5B1CD33B	Index	A measure of the development of finanical markets and institutions of a country in terms of their depth (size and liquidity), access (ability of individuals and companies to access finanical services) and efficiency (ability of institutions to provide financial services at low cost and with sustainable revenues and the level of activity of capital markets)
FX regime	FX_Regime	IMF classification of FX regimes from No separate legal tender (1) to Free floating (6).	Index (1 -6)	The IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)
Equity market index returr	EquityReturn	The logrithm return of domestic equity index	%	MSCI index
U.S. eqution volatility inde	VIX	CBOE VIX index	Index	CBOE VIX index
Global commodity return	CommodityReturn	The logrithm return of Bloomberg Commodity Index	Index	Bloomberg Commodity Index (BCOM) is calculated on an excess return basis and reflects commodity futures price movements. The index rebalances annually weighted 2/3 by trading volume and 1/3 by world production and weight-caps are applied at the commodity, sector and group level for diversification.

Data

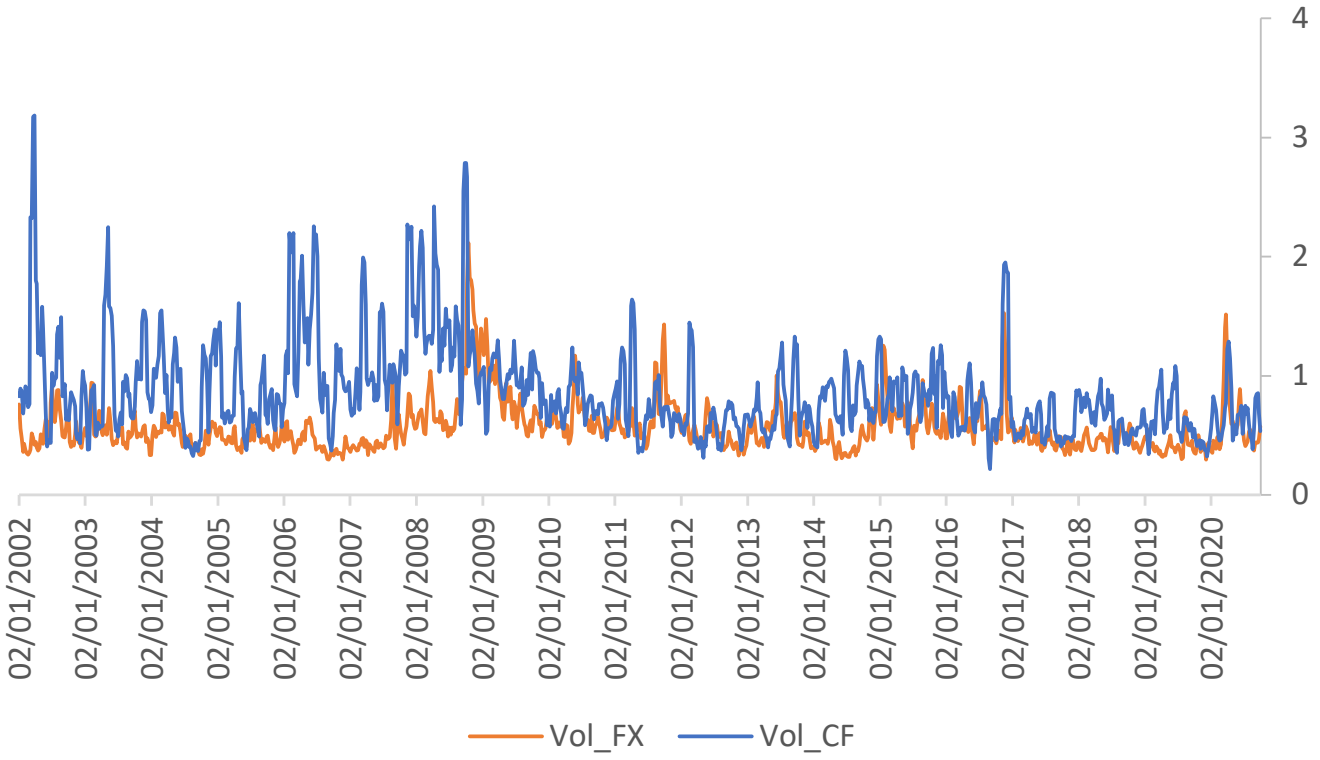
Table 3. Summary statistics of the variables

	Obs	Mean	Std. Dev.	Min	Max
2002 - 2020: weekly					
Vol_FX (Index)	19580	0.56	0.50	0.04	17.28
Vol_CF (%)	19580	0.86	1.63	0.00	37.30
2002Q1 - 2019Q4					
Vol_FX (Index)	1440	1.13	0.98	0.08	17.86
Vol_CF (%)	1440	1.10	1.60	0.00	20.38
CapitalFlow (%)	1440	0.09	0.84	-4.57	8.03
RealGDP_Growth (%)	1440	0.91	1.51	-9.01	19.21
TradeOpenness (% of annual GDP)	1440	20.01	20.03	3.52	100.88
FXReserve (% of annual GDP)	1440	0.53	1.67	-7.52	20.42
TFI (% of annual GDP)	1440	1.72	3.20	-7.29	28.83
CreditPrivate (% of annual GDP)	1440	132.93	60.97	23.00	392.40
ShortRate (%)	1440	3.39	3.83	-0.84	26.24
FiscalSurplus (% of annual GDP)	1440	-0.52	1.05	-3.62	1.99
FinancialDevelopment (Index)	1440	0.66	0.20	0.27	1
FX_Regime (Index)	1440	4.95	1.40	2	6
EquityReturn (%)	1440	1.62	12.14	-72.02	46.58
VIX (Index)	1440	18.90	7.97	10.30	58.32
CommodityReturn (%)	1440	-0.13	9.16	-35.84	15.35

Data

Figure 1. Weekly volatility of nominal effective FX rates (Vol_FX) and capital flows (Vol_CF)

Panel A. Average over all countries



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Cluster analysis

- **Hypothesis**: countries with sound-economic conditions have a smaller response of Vol_FX to Vol_CF shocks

- Step 1: K-means clustering algorithm → categorize the sample countries into two clusters based on their economic factors

- Step 2: Pedroni's (2013) Panel Structure VARs model:

{Vol_CF, Vol_FX, EquityReturn}

	Vol_CF	Vol_FX	EquityReturn
Vol_CF	1	1	1
Vol_FX	0	1	1
EquityReturn	0	0	1

(1)

→ IRF of Vol_FX to structural shocks of Vol_CF for the two comparative clusters

Cluster analysis

Table 5. K-means clusters

Panel A. Free float FX regime		*Panel B. Managed FX regime*	
Country	K-means Cluster (1,2)	Country	K-means Cluster (1,2)
Brazil	1	Czech Republic	1
Chile	1	Egypt	1
India	1	Malaysia	1
Thailand	1	Morocco	1
Australia	2	Russia	1
Canada	2	China	1
Japan	2	Hong Kong	2
Korea	2	Singapore	2
Sweden	2		
Switzerland	2		
United Kingdom	2		
United States	2		

Cluster analysis

Table 6. The mean value of the economic factors of the K-means clusters, and EMEs *vs* AEs.

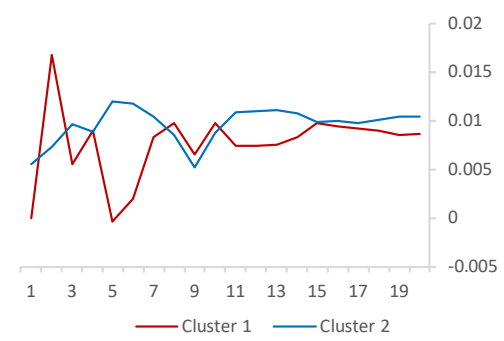
Variables, panel mean, 2002Q1-2019Q4	RealGDP_Growth	TradeOpenness	FX_Reserve	TFI	CreditPrivate	ShortRate	FiscalSurplus	FinanicalDevelopment	FX_Regime
High/Low as to sound economic conditions	High	High	High	High	High	Low	High	High	-
Panel A. Countries with free float FX regime									
Cluster 1 (Less-sound economic conditions)	1.04	13.16	0.45	0.76	84.50	6.13	-0.74	0.53	6
Cluster 2 (Sound economic conditions)	**0.53**	**12.00**	**0.30**	1.58	179.74	1.68	-0.54	0.86	6
Panel B. Countries with managed FX regime									
Cluster 1 (Less-sound economic conditions)	1.27	17.38	0.56	0.62	87.58	4.65	-0.78	0.46	3.5
Cluster 2 (Sound economic conditions)	**1.08**	73.67	1.52	7.45	178.56	0.95	0.73	0.74	3
Panel C. EMEs vs. AEs									
Emerging Market Economies (EMEs)	1.15	15.82	0.51	0.70	93.55	5.03	-0.67	0.52	4.6
Advacnced Economies (AEs)	**0.61**	25.13	0.57	2.96	181.06	1.39	-0.35	0.84	5.3

Cluster analysis

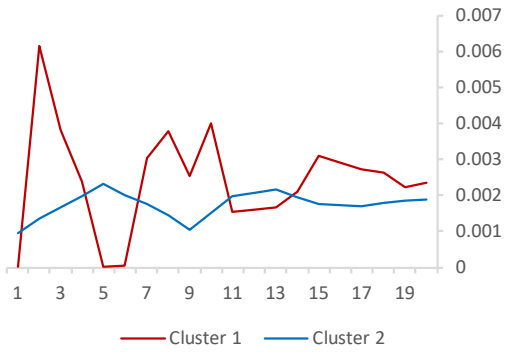
Figure 2. The IRF of Vol_FX to Vol_CF shocks

1. Response to composite shocks
2. Response to common shocks
3. Response to idiosyncratic shocks

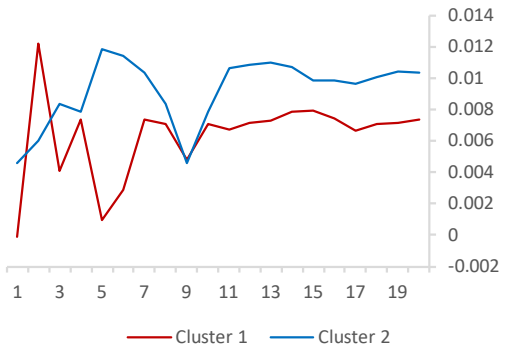
Panel A. Countries with free float FX regime: Cluster 1 (less sound economic condition) and Cluster 2 (sound economic condition)



(A.1)

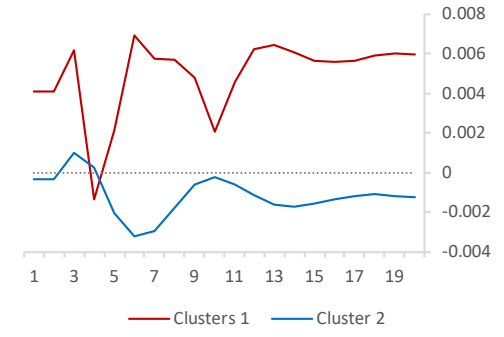


(A.2)

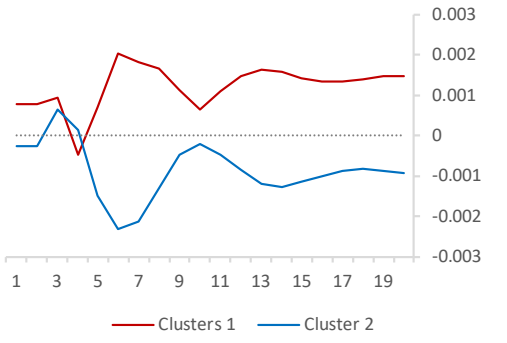


(A.3)

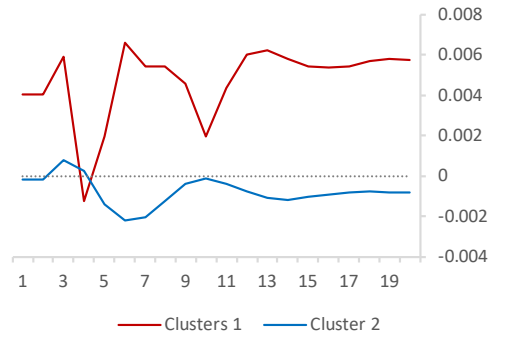
Panel B. Countries with managed FX regime: Cluster 1 (less sound economic condition) and Cluster 2 (sound economic condition)



(B.1)



(B.2)



(B.3)

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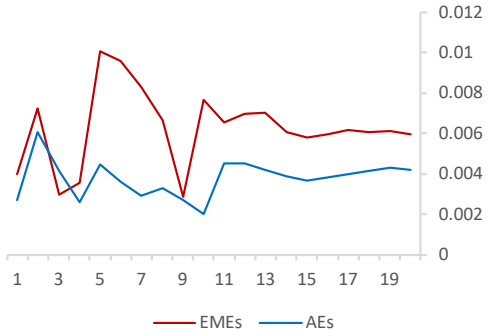
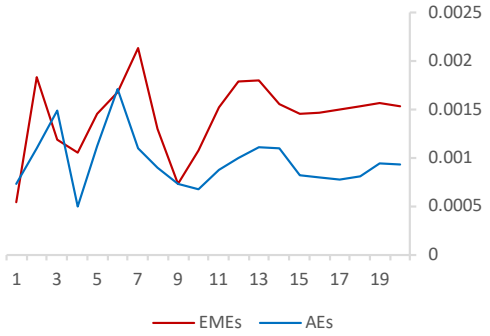
Cluster analysis

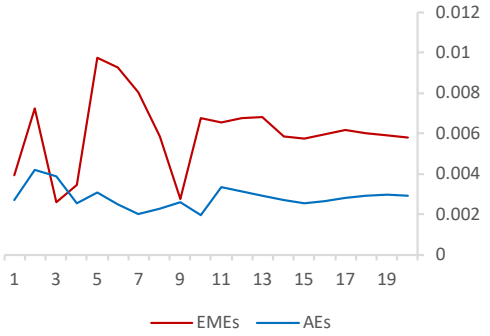
Panel C. EMEs vs AEs



(C.1)



(C.2)



(C.3)

Summary: the clustering analysis supports our hypothesis that countries with heathy economic conditions can better absorb CF volatility shocks and stabilize FX volatility than countries with less heathy economic conditions.

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Threshold analysis

$$Vol\_FX_{it} = \partial + \gamma_1 Vol\_CF_{it} + \gamma_2 Vol\_CF_{it} * MF_{it} + \gamma_3 MF_{it} + \gamma_4 X_{it} + \varepsilon_{it} \quad (2)$$

Threshold of *MF* (i.e. $\widetilde{MF}$) above which the mitigating effect takes place can be computed as:

$$\frac{\partial(Vol\_FX_{it})}{\partial(Vol\_CF_{it})} = \gamma_1 + \gamma_2 MF_{it} < 0 \Leftrightarrow MF_{it} > \widetilde{MF} := -\frac{\gamma_1}{\gamma_2}, \quad for\ mitigating\ factors$$

$$\frac{\partial(Vol\_FX_{it})}{\partial(Vol\_CF_{it})} = \gamma_1 + \gamma_2 MF_{it} > 0 \Leftrightarrow MF_{it} < \widetilde{MF} := \frac{\gamma_1}{\gamma_2}, \quad for\ aggravating\ factors \quad (3)$$

Table 7. Estimates of the FX volatility mitigating factors and their thresholds

Dependent variable: Vol_FX	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Vol_CF	0.018	0.041	0.021	0.067	0.073	-0.039	0.019	0.091
	(1.6)*	(2.91)***	(2.01)**	(4.03)***	(2.84)***	(-3.04)***	(1.67)*	(2.61)***
Vol_CF*RealGDP_Growth	-0.001							
	(-0.19)							
RealGDP_Growth	-0.018	-0.020	-0.020	-0.026	-0.018	-0.021	-0.021	-0.019
	(-1.4)	(-2.14)**	(-2.25)**	(-1.7)*	(-2.01)**	(-2.33)**	(-1.95)**	(-2.1)**
Vol_CF*TradeOpenness		-0.002						
		(-4.15)***						
TradeOpenness	-0.001	0.002	-0.001	-0.001	-0.001	0.000	0.000	-0.001
	(-0.69)	(-0.97)	(-0.3)	(-0.27)	(-0.55)	(-0.2)	(-0.1)	(-0.47)
Vol_CF*FXReserve			-0.013					
			(-2.18)**					
FXReserve	0.001	0.003	0.012	-0.005	0.001	0.000	-0.001	-0.001
	-0.08	-0.34	-1.21	(-0.41)	(-0.03)	(-0.02)	(-0.16)	(-0.11)
Vol_CF*TotalForeignInvestment				-0.015				
				(-2.44)***				
TotalForeignInvestment	-0.010	-0.010	-0.011	0.006	-0.010	-0.010	-0.009	-0.011
	(-2.03)**	(-1.92)**	(-2.27)	-0.44	(-2.08)**	(-2.1)**	(-1.54)	(-2.31)**
Vol_CF*CreditToPrivate					-0.001			
					(-2.93)***			
CreditToPrivate	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
	(1.61)*	(-0.96)	-1.13	-1.05	(1.83)*	-0.99	-1.29	
Vol_CF*ShortRate						0.008		
						(3.62)***		
ShortRate	0.065	0.062	0.071	0.060	0.064	0.058	0.052	0.070
	(6.25)***	(-5.95)***	(6.9)***	(5.08)***	(6.86)***	(5.18)***	(4.25)***	(6.9)***
Vol_CF*FiscalSurplus							-0.061	
							(-5.11)***	
FiscalSurplus	-0.034	-0.050	-0.037	-0.055	-0.030	-0.042	0.042	-0.037
	(-1.46)	(-2.11)**	(-1.65)*	(-1.49)	(-1.41)	(-1.88)*	-1.42	(-1.66)*
Vol_CF*FinanicalDevelopment								-0.135
								(-2.6)***
FinanicalDevelopment								0.012
								(-0.03)
FX_Regime	0.333	0.376	0.347	0.314	0.340	0.358	0.409	0.370
	(4.45)***	(4.86)***	(4.75)***	(1.94)**	(4.63)***	(4.86)***	(4.77)***	(4.61)***
EquityReturn	-0.010	-0.010	-0.009	-0.014	-0.010	-0.009	-0.006	-0.010
	(-6.59)***	(-6.71)***	(-6.24)***	(-6.46)***	(-6.29)***	(-6.16)***	(-3.5)***	(-6.48)***
CapitalFlow	0.093	0.096	0.093	0.157	0.088	0.079	0.060	0.088
	(5.56)***	(5.77)***	(5.78)***	(5.97)***	(5.33)***	(4.95)***	(3.2)***	(5.44)***
VIX	0.016	0.016	0.016	0.021	0.016	0.016	0.015	0.016
	(5.68)***	(5.64)***	(5.69)***	(4.39)***	(5.81)***	(5.86)***	(4.61)***	(5.9)***
CommodityReturn	-0.006	-0.006	-0.006	-0.005	-0.006	-0.006	-0.006	-0.006
	(-3.14)***	(-3.1)***	(-3.34)***	(-1.64)*	(-3.37)***	(-3.38)***	(-2.77)***	(-3.37)***
Constant	-1.593	-1.827	-1.662	-1.637	-1.676	-1.658	-1.885	-1.627
	-3.80	(-4.16)***	(-4.07)***	(-1.70)*	(-4.02)***	(-4.02)***	(-3.90)***	(-3.79)***
Country fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald tests (p-values)	0	0	0	0	0	0	0	0

Threshold	RealGDP_Growth	TradeOpenness	FXReserve	TotalForeignInvestment	CreditToPrivate	ShortRate	FiscalSurplus	FinanicalDevelopment
Point estimate	-	25.6	1.6	4.6	144.3	5.1	0.3	0.7
Threshold confidence interval bound: 90% confidence interval lower bound to the point estimate	-	[8, 25.6]	[0.2, 1.6]	[1.6, 4.6]	[38.5, 144.3]	[5.1, 1.6]	[0, 0.3]	[0.2, 0.7]

FX resilience index

$$FX\_Resillience_i = \sum_{m=1}^{m} \widehat{\gamma_2}\, MF_i \qquad (4)$$

Table 8. FX resilience index ranking

FX resilience index ranking			
Panel A.1 Free float FX regime		*Panel A.2 Managed FX regime*	
Switzerland	-0.45	Hong Kong	-0.69
Sweden	-0.37	Singapore	-0.50
Korea	-0.33	Malaysia	-0.24
Canada	-0.32	China	-0.23
Australia	-0.29	Czech Republic	-0.17
Thailand	-0.25	Russia	-0.13
United Kingdom	-0.24	Morocco	-0.06
Chile	-0.22	Egypt	0.12
Japan	-0.22		
United States	-0.18		
Brazil	0.01		
India	0.03		

Panel B.1 EMEs		*Panel B.2 AEs*	
Korea	-0.33	Hong Kong	-0.69
Thailand	-0.25	Singapore	-0.50
Malaysia	-0.24	Switzerland	-0.45
China	-0.23	Sweden	-0.37
Chile	-0.22	Canada	-0.32
Czech Republic	-0.17	Australia	-0.29
Russia	-0.13	United Kingdom	-0.24
Morocco	-0.06	Japan	-0.22
Brazil	0.01	United States	-0.18
India	0.03		
Egypt	0.12		

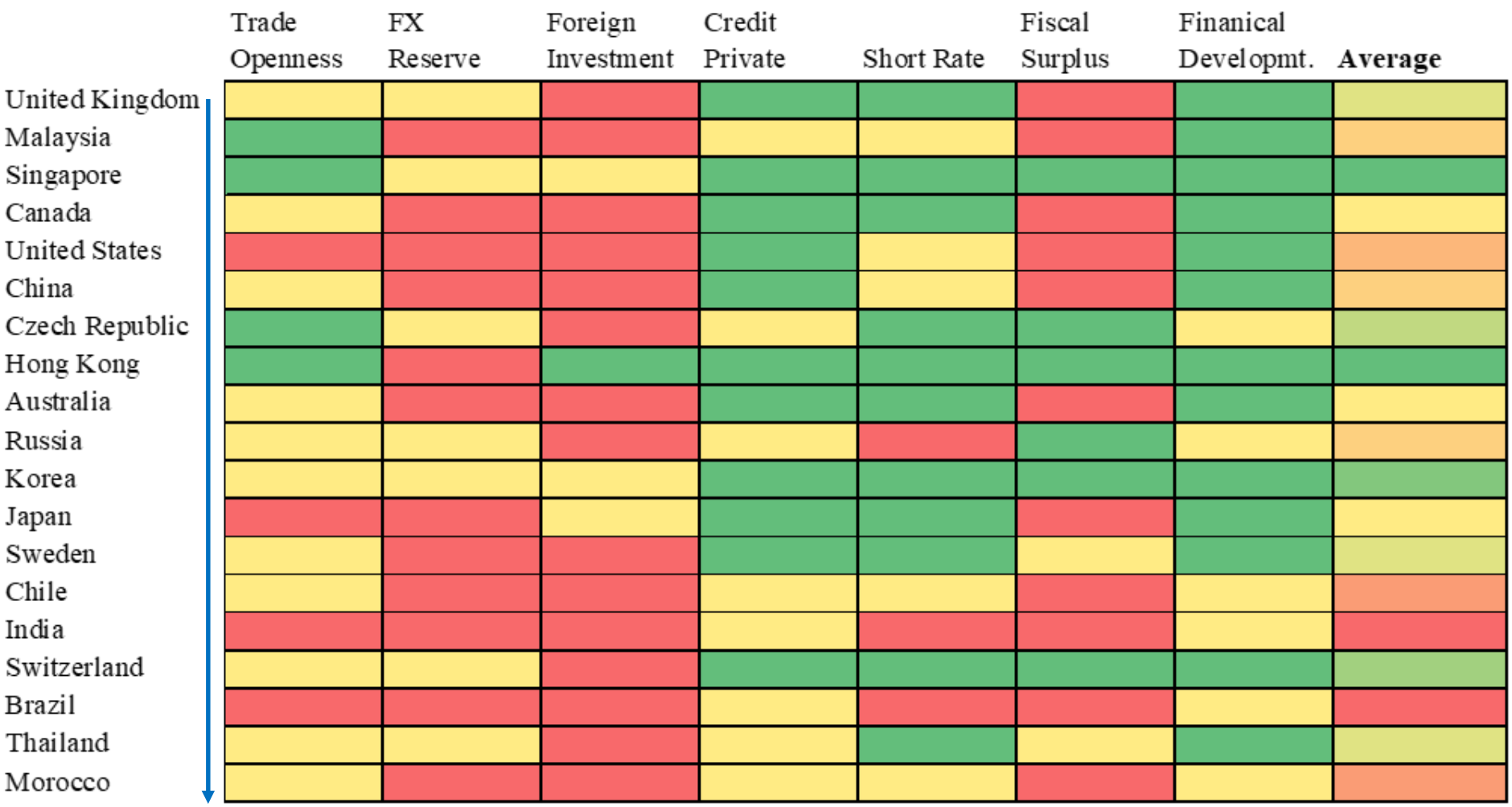
Case study 1:
The 2018 emerging market currency crisis

Table 9. Case study of mitigating factor thresholds: the U.S. Federal Reserve interest rate hike in 2018

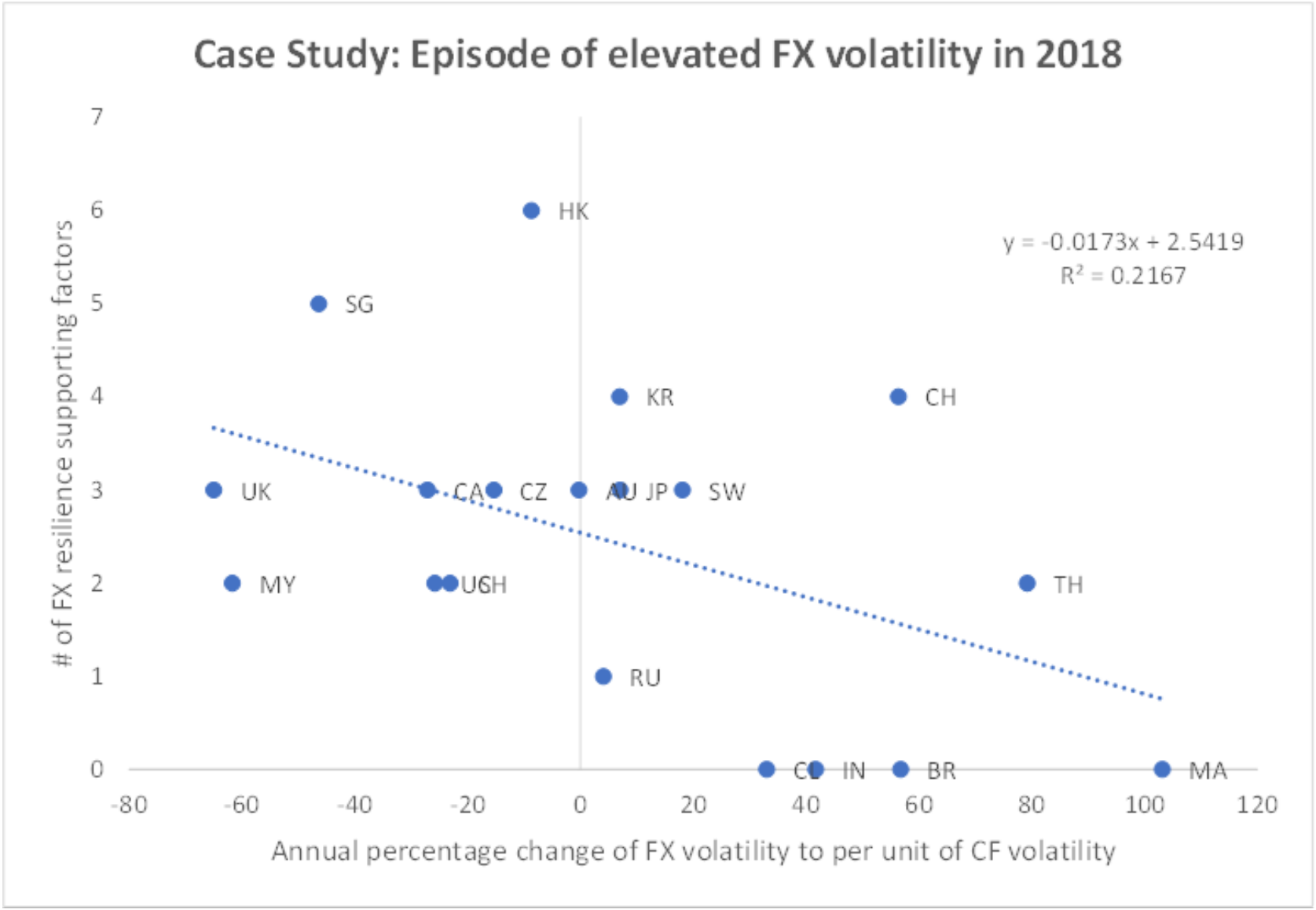
Panel A. FX volatility mitigating factors vs annual percentage change of FX volatility to per unit of CF volatility in 2018

Country code	Threshold range: 90% confidence interval lower bound to point estimate	TradeOpenness [8, 25.6]	FXReserve [0.2, 1.6]	TotalForeignInvestment [1.6, 4.6]	CreditToPrivate [38.5, 144.3]	ShortRate [5.1, 1.6]	FiscalSurplus [0, 0.3]	FinanicalDevelopment [0.2, 0.7]	Change in Vol_FX per Vol_CF (%): 2018 vs 2017	No. of supporting factors (i.e. attaining the point estimate thresholds)
	Mean: 2018									
UK	United Kingdom	9.8	0.2	-1.1	**166.8**	**0.6**	-0.5	**0.9**	-65	3
MY	Malaysia	**26.7**	0.1	0.6	135.8	3.2	-0.8	**0.7**	-62	2
SG	Singapore	**54.7**	0.9	1.7	**166.1**	**1.3**	**0.9**	**0.8**	-46	5
CA	Canada	13.4	0.0	1.4	**211.0**	**1.4**	-0.1	**0.9**	-27	3
US	United States	5.1	0.0	0.3	**150.6**	1.8	-1.7	**0.9**	-26	2
CH	China	8.0	0.0	0.4	**203.1**	2.7	-1.2	**0.7**	-23	2
CZ	Czech Republic	**31.9**	0.2	0.6	89.0	**1.3**	**0.3**	0.5	-15	3
HK	Hong Kong	**80.8**	0.1	**11.9**	**298.8**	**1.4**	**0.6**	**0.8**	-9	6
AU	Australia	8.6	-0.2	1.1	**195.2**	**1.5**	-0.2	**0.9**	0	3
RU	Russia	10.4	0.6	0.4	63.0	7.1	**0.7**	0.5	4	1
KR	Korea	16.6	0.3	1.6	**185.4**	**1.5**	**0.6**	**0.8**	7	4
JP	Japan	7.4	0.1	1.7	**157.4**	**-0.1**	-0.6	**0.9**	7	3
SW	Sweden	15.7	0.0	0.4	**248.6**	**-0.7**	0.2	**0.8**	18	3
CL	Chile	12.3	0.1	0.5	139.8	2.5	-0.4	0.5	33	0
IN	India	7.8	0.0	0.0	56.1	6.2	-1.6	0.4	42	0
CH	Switzerland	21.7	0.5	0.9	**248.9**	**-0.7**	**0.4**	**1.0**	56	4
BR	Brazil	5.6	0.0	0.0	69.0	6.5	-1.7	0.6	57	0
TH	Thailand	23.7	0.4	1.1	116.0	**1.5**	0.0	**0.7**	79	2
MA	Morocco	14.7	-0.2	0.2	85.8	2.3	-0.9	0.4	103	0

Panel B. FX volatility mitigating factors in 2018



Panel C. The correlation of the number of FX resilience supporting factors and annual percentage change of FX volatility to per unit of CF volatility in 2018.



Case study 2: the 2020 Covid-19 pandemic

Table 10. Case study of FX resilience index: the 2020 Covid-19 pandemic

FX resilience index ranking		Change in FX volatility ranking	
FX resilience index: 2019		Change in Vol_FX per Vol_CF (%): 2020 *vs* mean of [2015, 2019]	
		Panel A. EMEs	
Korea	-0.35	Korea	-37.49
Thailand	-0.29	China	-22.22
Malaysia	-0.28	Thailand	-19.74
Czech Republic	-0.22	India	-12.09
China	-0.20	Malaysia	-7.57
Chile	-0.20	Brazil	-4.92
Russia	-0.16	Russia	1.13
Morocco	-0.09	Chile	31.45
Brazil	-0.04	Czech Republic	64.44
India	0.02	Morocco	85.74
Egypt	0.16	Egypt	95.52
		Panel B. AEs	
Hong Kong	-0.56	Hong Kong	-54.26
Switzerland	-0.46	United Kingdom	-19.06
Singapore	-0.42	Sweden	-15.72
Sweden	-0.40	Australia	-7.73
Canada	-0.36	Switzerland	-2.50
Australia	-0.32	Singapore	-2.39
Japan	-0.27	United States	10.13
United Kingdom	-0.27	Japan	49.13
United States	-0.18	Canada	85.64

Key takeaways

- FX volatility responds to composite CF volatility shocks in a smaller scale for countries with sound economic factors, regardless of FX regimes.

- Some economic factors, when exceeding certain thresholds, can significantly mitigate the adverse impact of CF volatility on FX volatility during times of heightened CF volatility, → trade openness, FX reserve, total foreign investment, credit to private sectors, short-term interest rate, fiscal surplus and financial development.

- FX resilience index comprises the mitigating factors and their elasticity to FX volatility associated with CF volatility → an intuitive measure, showing that countries with lower ranking in the index generally experienced greater FX volatility during the 2018 emerging market currency crisis and the 2020 Covid-19 pandemic