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Central Bank Support for Spot and Derivative Foreign Exchange Markets

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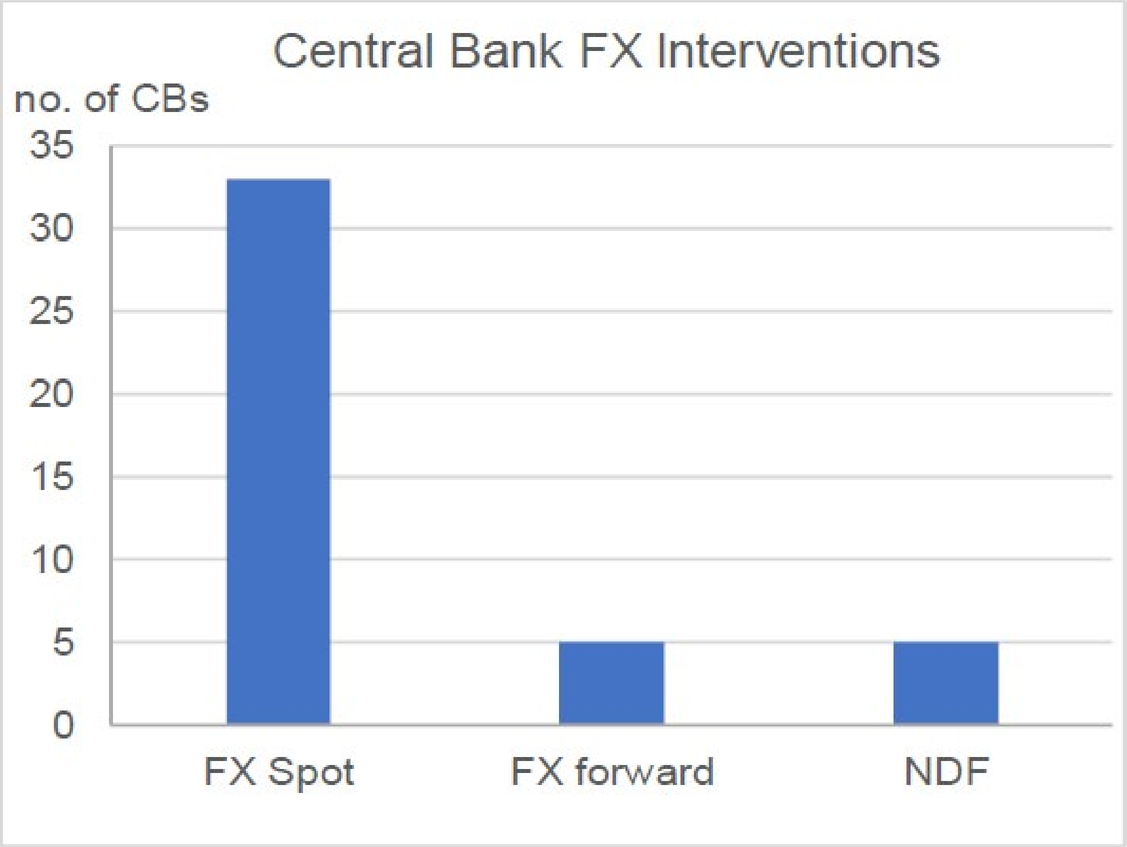
Central banks in many jurisdictions have intervened in FX markets during the COVID-19 Pandemic

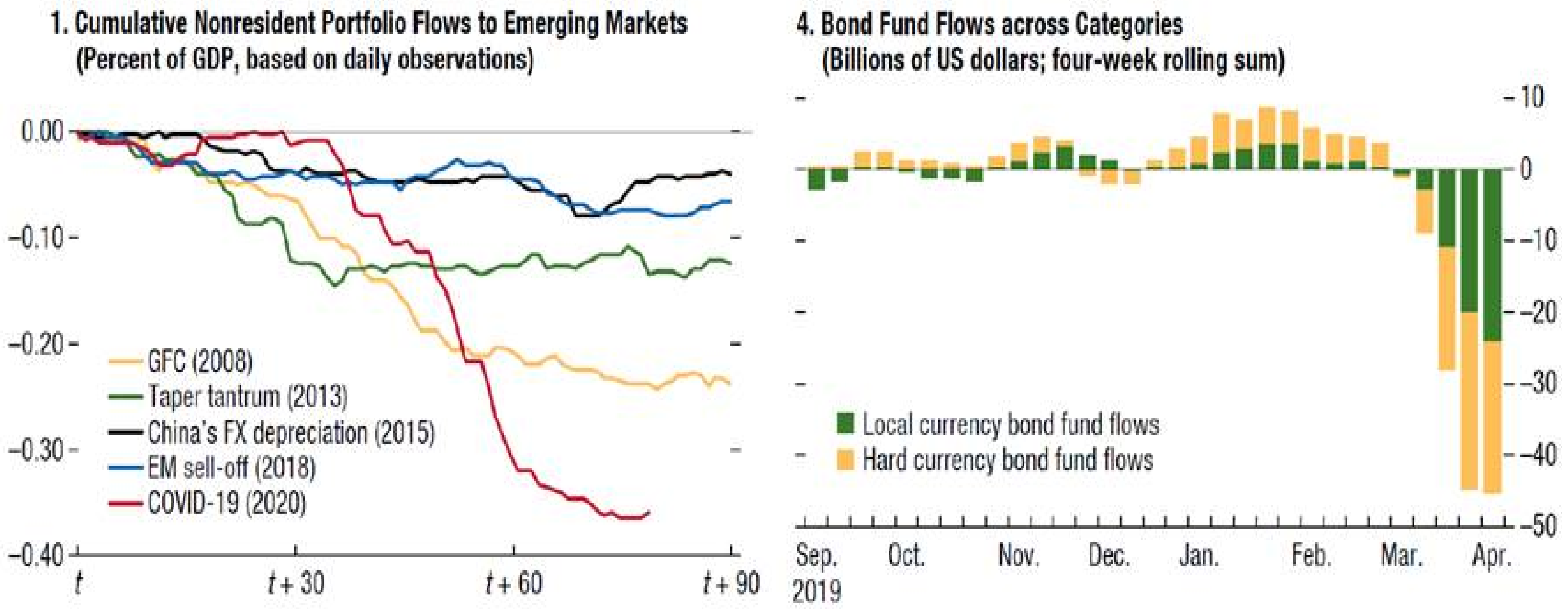
- **The COVID-19 pandemic has affected FX markets in most jurisdictions**
  - The scale of capital outflows from emerging markets triggered by the pandemic was unprecedented.
  - In addition, commodity-exporting economies lost significant FX revenues due to declining commodity prices.
  - Tourism revenues and remittances have also declined sharply
  - **CBs in many jurisdictions intervened in FX markets during the pandemic ...** around 50+ central banks intervened in FX markets.
  - Few used multiple instruments and intervened in multiple market segments (e.g., spot, derivative)



See IMF COVID-19 Central Bank Intervention Database

Portfolio Flows to Emerging Markets

More Frequent FX intervention seen in EMEs due to capital outflows

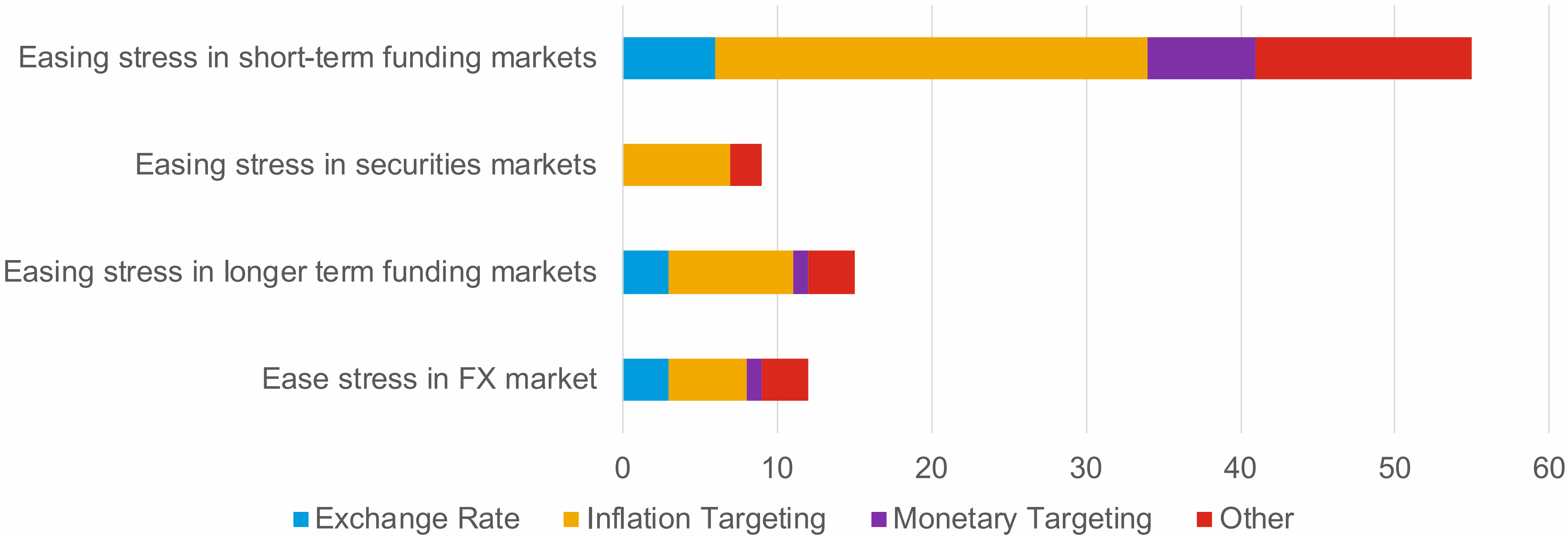


Sources: Bloomberg Finance L.P.; EPFR Global; Haver Analytics; Institute of International Finance; and IMF staff calculations.

April 30, 2020 – COVID Pandemic

Central Bank Intervention Database

Intervention Objectives by Asia Pacific Central Banks …



Central Bank Intervention Database

Summary of Measures Taken by AE Central Banks[1]

Markets / Objectives	Monetary policy easing	Easing stress in short-term funding markets	Easing stress in longer term funding markets	Easing stress in securities markets	Easing stress in FX market	Total
Money market	12	38			1	51
FX swap		15			2	17
Funding market		3	11			14
Government securities	6	1		7		14
Non-government securities				12		12
Private short-term debt market		4		1		5
FX market (spot and derivatives)					5	5
Total	18	61	11	20	8	118

1/: Australia, Canada, Hong Kong, Czech Republic, Denmark, European Central Bank, Iceland, Israel, Japan, South Korea, New Zealand, Norway, Singapore, Sweden, Switzerland, United Kingdom, and the United States.

COVID Pandemic – IMF Intervention Database

Summary of Measures Taken by EME Central Banks[2]

Markets / Objectives	Monetary policy easing	Easing stress in short-term funding markets	Easing stress in longer term funding markets	Easing stress in securities markets	Easing stress in FX market	Total
Money market	52	87	3	2		144
FX swap		12			13	25
Funding market		1	39			40
Government securities			1	14		15
Non-government securities			1	5		6
Private short-term debt market		1				1
FX market (spot and derivatives)					27	27
Total	52	101	44	21	40	258

2/: Algeria, Argentina, Armenia, Aruba, Bahrain, Barbados, Botswana, Brazil, Bulgaria, Cabo Verde, Chile, China, Colombia, Costa Rica, Croatia, Dominican Republic, Egypt, Eswatini, Fiji, Georgia, Hungary, India, Indonesia, Iran, Jamaica, Jordan, Kazakhstan, Lebanon, Malaysia, Maldives, Mauritius, Mexico, Mongolia, Morocco, North Macedonia, Oman, Pakistan, Paraguay, Peru, Philippines, Poland, Romania, Russian Federation, Saudi Arabia, Serbia, Seychelles, South Africa, Sri Lanka, Thailand, Trinidad and Tobago, Turkey, Ukraine, United Arab Emirates, Uruguay, and Venezuela.

COVID Pandemic – IMF Intervention Database

Summary of Measures Taken by LIC Central Banks[3]

Markets / Objectives	Monetary policy easing	Easing stress in short-term funding markets	Easing stress in longer term funding markets	Easing stress in securities markets	Easing stress in FX market	Total
Money market	30	43				73
FX swap					1	1
Funding market			9			9
Government securities				4		4
Non-government securities						0
Private short-term debt market		1				1
FX market (spot and derivatives)					9	9
Total	30	44	9	4	10	97

3/: Bangladesh, Central Bank of West African States, Bank of Central African States, Cambodia, Democratic Republic of the Congo, Ethiopia, Gambia, Ghana, Haiti, Honduras, Kenya, Kyrgyz Republic, Lao People's Democratic Republic, Lesotho, Madagascar, Malawi, Mauritania, Moldova, Mozambique, Myanmar, Nepal, Nicaragua, Nigeria, Papua New Guinea, Rwanda, Sierra Leone, Tajikistan, Uganda, Uzbekistan, Zambia, and Zimbabwe.

COVID Pandemic – IMF Intervention Database

The rationale to support FX markets is grounded in central bank mandates

- Supporting FX market functioning is instrumental to preserve financial stability and monetary policy transmission, key for price stability and **consistent with modern central bank mandates**

- **Market impairment could** lead to an exchange rate overshoot that **compromises price and financial stability objectives –** direct and indirect unhedged exposures to exchange rate **risk**.

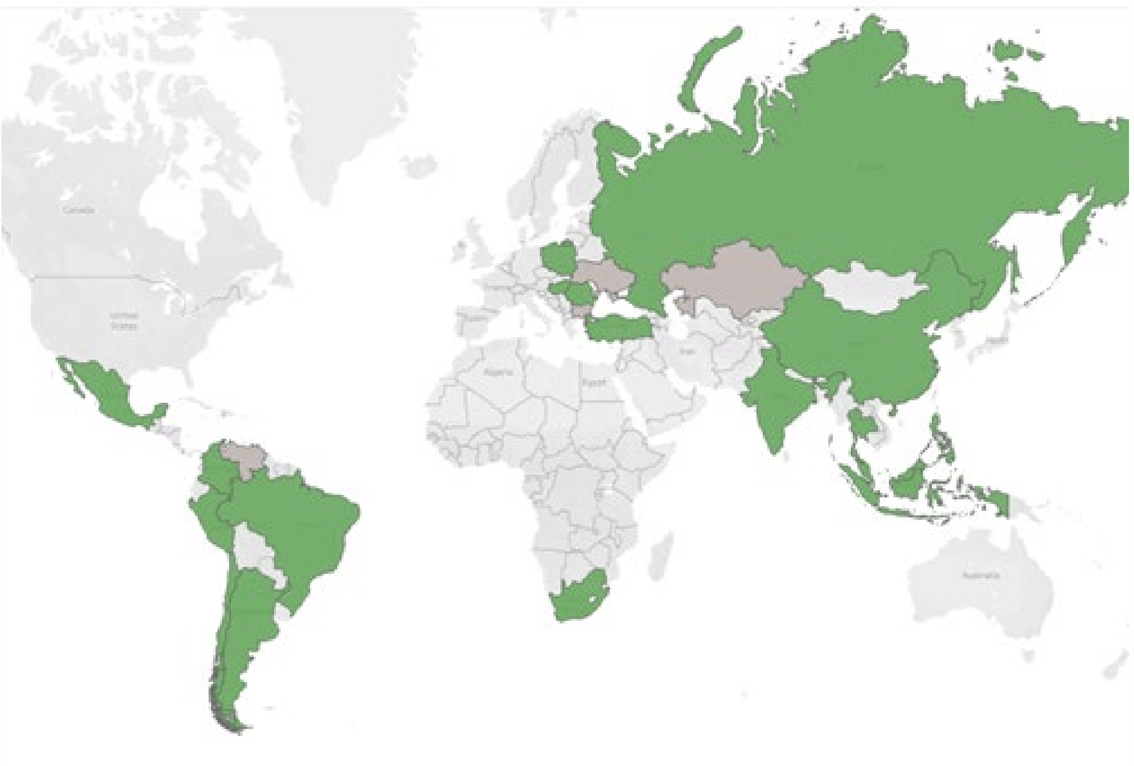
- **Necessary to ensure that markets are not impaired** such that it becomes difficult for FX market users to manage and hedge FX risks and meet FX needs

- IMF COVID Note "*Central Bank Support to Financial Markets in the Coronavirus Pandemic*"[1], raised three questions, that we look at from FX market perspective vis-à-vis;
  - How does one determine whether an FX market is important for financial stability and monetary policy transmission in a given jurisdiction?
  - Under what circumstances should central banks intervene?
  - How does one design FX interventions in relevant FX market?

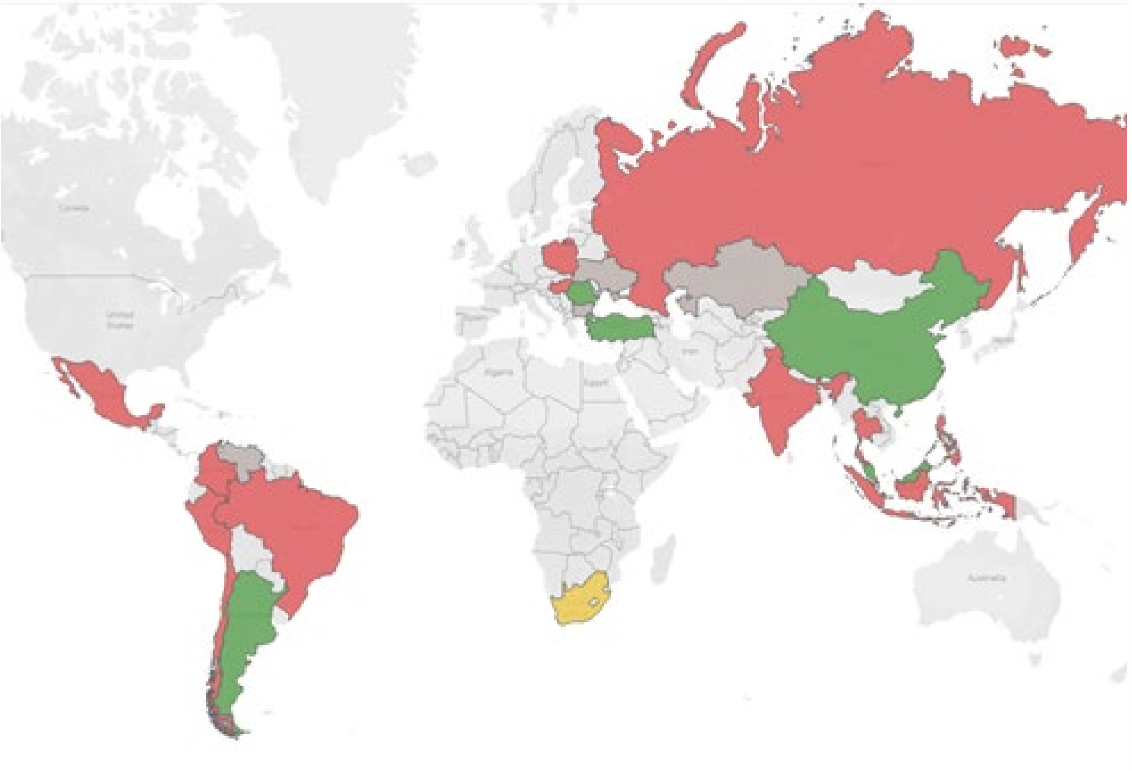
1:/ The presentation is based on a joint note that was authored by Romain Lafarguette, Istvan Mak, Asad Qureshi and Romain Veyrune.

Market FX Implied Volatility ...

Indicator: FXVOL – FX Implied Volatility, 3-month ATM Option Bloomberg



December 31, 2019 – A Happy World



March 31, 2020 – COVID Pandemic

DMC Monitor The indicator looks for possible signs of DMC by identifying tail movements and distressed levels in key financial variables across different markets (FX, debt, and equity). Composite country-specific DMC indicators, developed employing principal component analysis, are proposed for a set of 23 countries[1] from 2008.

1/: Argentina, Brazil, Bulgaria, Chile, China, Colombia, Hungary, India, Indonesia, Kazakhstan, Korea, Malaysia, Mexico, Peru, Philippines, Poland, Romania, Russia, South Africa, Thailand, Turkey, Ukraine, Venezuela

What are Disorderly Market Conditions (DMC)?

How to define DMC? The DMC are temporary phenomena in which the ER can stop being a shock absorber and start playing as a shock amplifier. In such situation markets stop operating:

- become one-sided and illiquid;
- normal market-clearing breaks up, price signals may not be informative; and
- market participants shift their focus from fundamentals to the behavior of other market participants,
- making conditions prone to herd-like investor behavior.

What factors should be looked at for DMC?

- The risks of DMC vary by countries and circumstances, depend on;
  - Exchange rate valuation, On- and off-balance sheet (un-hedged) exposures
  - Depth of FX and domestic financial markets (shallow markets can amplify the effects of shocks)
  - Financial market structure, including key investors having trading or investment restrictions embedded in their guidelines (e.g., stop-loss orders, permissible holdings limited to investment-grade assets)
- The determination of when market conditions have become disorderly can rely on a number of market indicators but also requires an element of judgment.
- Indicators of DMC[1] include *inter alia* measures of risk, volatility, widening bid/ask spread and liquidity in the foreign exchange and other financial markets.

1:/ DMC Monitor: IMF DMC monitor is a weighted average of *twenty-three financial indicators*, capturing potential manifestations of DMC in **debt**, **equity** and **FX** markets

How to design a market support program?

Steady State FXI Framework Considerations

Defining framework

Clear Objectives – Why the need to Intervene?

Why the Central Bank should be in the Market? What is it trying to achieve?

Modalities of Interventions, consistent with objective

… When? How? and Where?

Triggers and indicators—Mode, instrument choice, frequency—Which market

Constraints & limiting risks …

Available reserves, Market microstructure and counterparties

Transparency & Communication.

Policy *transparency* vs ***Operational*** *transparency*

ex ante - real-time - *ex post*

Consistency of other policies.

Support of market functioning, Intervention or Monetary framework do not exist in isolation

FXI Framework Considerations

Why?

Communication
- Exposure to ER risk in the economy determines the importance of FX market

When?

Governance
- Decision-making process
- Indicators
- Triggers

How?

Parameters
- Mode
- Instrument
- Budget (daily, quarter)

Where?

Implementation
- Targeted Market
- Counterparties

COMMUNICATION—WALK THE TALK … be able to explain rationale for action

Communication

- **Clearly communicating objectives** to market is essential, to determine
  - Why to intervene – Is it to …
    - Address Disorderly Market Condition or Market Dysfunction
    - Correcting Misalignment or overshooting of ER or Smoothing the path

- **Vague objectives can create confusion about FXI objectives and undermine the credibility** – especially with frequent market presence

- **FXI intends to Limit Excessive Volatility, Does Not Eliminate it** – allows markets to manage and determine exchange rate

- **CB's credibility about its commitment to policy objective is crucial, hence**
  - Clear rules of engagement for FXI give clearer message that the main objective is the preserving market functioning and not a specific exchange rate level.

- Broad policy objective(s), the operational framework and instruments of the FXI, if clearly communicated helps predictability and enhanced transparency in FXI, reduce instability.

Governance

- **Clearly documenting the decision-making process, when to intervene**

- **When to intervene should include;**
  - Objective criteria (indicators and triggers)
  - Rules to rationalize decision
  - FXI should be aligned with other policy stances

- **Lack of Clarity on decision-making process can result in …**
  - Frequent operations, impedes market development
  - Wrong choice of instrument, resulting in marginal effectiveness
  - Multiple Objectives disguises real problems

Intervention Triggers

A clear understanding when to intervene needed	Triggers should be linked to Indicators – Price or Volume based	Indicators Signal Distress
• The triggers should help identify conditions, when market liquidity has deteriorated substantially relative to normal conditions. • Besides quantitative indicators, market intelligence, analyzing why and piecing together story plays an important role in deciding whether to intervene.	**Price-based indicators** • day day-to -day volatility, • bid/ask spreads, and • spreads vis vis-à-vis a risk risk-free rates. **Volume-based indicators** • order book, flows, turnover • On- and off-balance sheet (un-hedged) exposures • ratio of the change in price to the change in volume	• Indicators signal distress when the measure moves sufficiently far. • Cost of hedging is a key variable • Volatility triggers should have several properties.

Case of Derivatives

- **In case of Forward and NDFs, the cost of hedging is the key variable to monitor**

- **Key indicators to watch;**
  - **Deviations between notional and theoretical curves**
  - **Off-balance sheet (un-hedged) exposures**

- **Modalities for forward intervention.** The allotment objective can take two forms:
  - **Rolling over a defined amount** (share of normal trading volume and consistent with the budget limits) to guarantee a minimum depth to the market; or
  - **Interventions, when the cost of hedging exceeds a threshold** that leads to a transfer of the demand to the spot market.
  - In the latter case, contract prices should be high enough vis-à-vis the theoretical hedging cost to self-liquidate the program as market conditions improve.

FXI Framework Sum-up

Motivation – Market Importance

Exposure to ER risk in the economy determine the importance of FX market

Open mismatch exposures

Inflation pass-through

Even in less developed jurisdictions, the FX spot market is often one of the few financial markets with some depth

What Circumstances Central Banks Intervene

FXI Indicators

* Bid/ask spreads
* Daily intraday price move
* Actual Implied volatility
* Portfolio flows

Analysis of underlying exposure to exchange rate risk is important

How to Design FXI in relevant Market

CB intervene in market that is functioning and exists.

Should understand the nature of impairment and stress it intends to address

Governance

Parameters

Implementation

Transparency

CB's credibility about its commitment to the policy objective is crucial!

Balance in **transparency** & **confidentiality**

Policy transparency versus **Operational** Transparency

FXI and Transparency

- **Issue of transparency in FXI has been the subject of much debate**, vis-à-vis;
  - **Policy** transparency versus **Operational** Transparency
  - Policies on **data disclosure**

- **CB's credibility about its commitment to the inflation target is crucial!**
  - Appropriate balance between **transparency** and **confidentiality**
  - *Constructive Ambiguity* perhaps holds in case of;
    - **Trading tactics:** oftentimes less transparent, to avoid some market participants from taking advantage (i.e., betting against CB) and undermine FXI objective
    - **Tactical ambiguity:** timing and size of intervention increase prospects of FXI being efficient (i.e., minimal amount of intervention)

- **Most CBs do not disclose FXI strategies ex-ante, ex-post transparency on the FXI data disclosure is widely seen as beneficial**
  - **48 countries disclose the FXI volumes**, a few at intervention time, others with a lag 1-mnth to 6-mnths.

- **Some central banks may prefer Discreetness to Transparency!**
  - Instance when FXI may be perceived inconsistent with monetary policy goals

The Central Bank Transparency Code: https://www.imf.org/en/publications/policy-papers/issues/2020/07/29/the-central-bank-transparency-code-49619

FX intervention rule based on Conditional VaR

Foreign Exchange intervention rules should be…

- **Adaptative**, depend on market conditions **–**
  - Need to push towards transparent, competitively clear operational approaches

- **Objective**, anchored to a risk tolerance level rather than an arbitrary FX level threshold

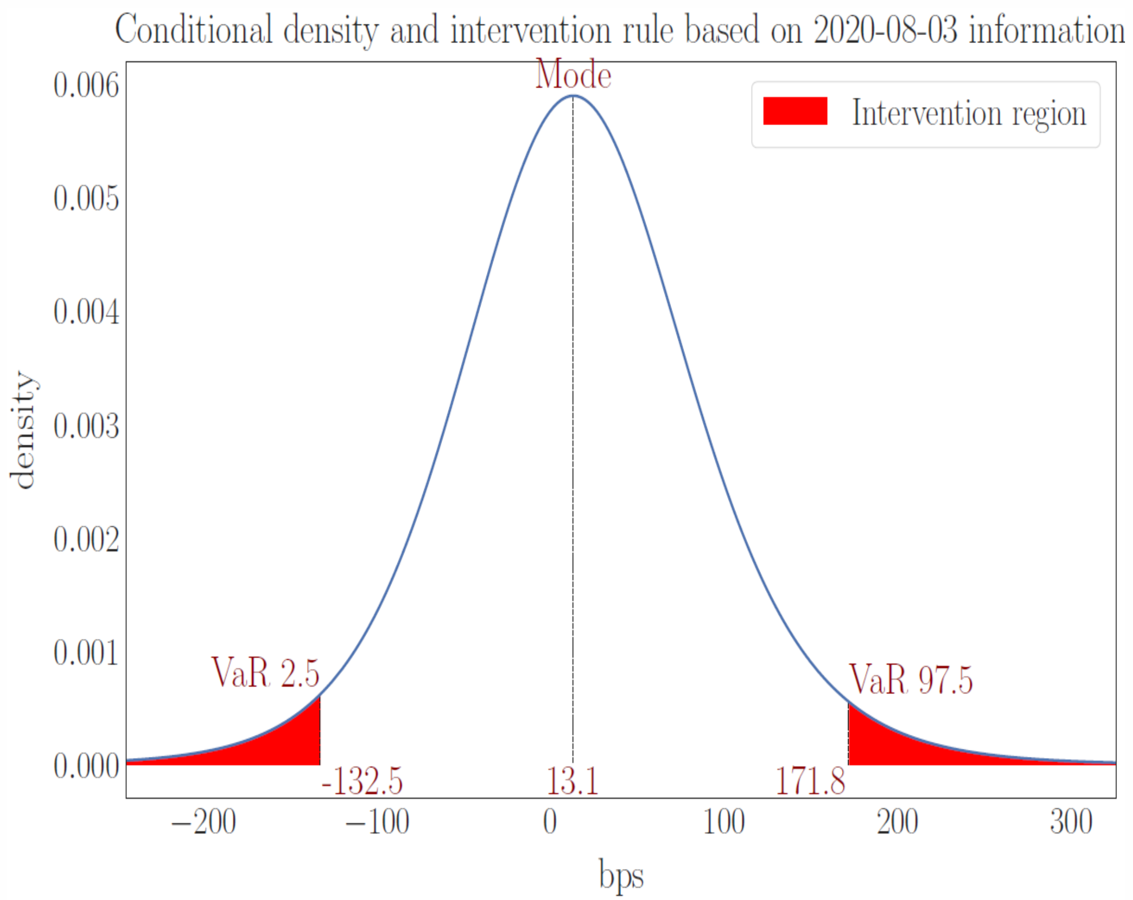
- Capture FX **non-linearities and asymmetries** between appreciation and depreciation

- Be easily **operationalizable**, and **financially viable**
  - Can inadvertently create distortions and MCP's e.g. FX Forwards and Swap

- Thoughts on **FX intervention rule based on Conditional Value-at-Risk …**

Concept: Value-at-Risk FXI Rule

- Rather than using a fixed volatility rule (e.g., if daily exchange rate varies by more than 2%)
- Use a **risk-based rule**: intervene when the daily exchange rate log-returns fall within the tails of the conditional distribution
- Measure the tail-risk via the concept of **Value-at-Risk**
- Conditional distribution can be estimated daily with a standard financial GARCH model and **varies with market conditions**
- The central bank decides on the **risk tolerance**: e.g., intervene in the tail at 1%, 5%, 10%, etc.



Main Features … Conditional VaR FXI Rule

Allows flexible exchange rate to act as a shock absorber:

- more flexibility in crisis time => **avoid overshooting**
- **No excessive interventions** in crisis time, often ineffective and costly (exhaust FX reserves)
- No free insurance to the market: avoid **moral hazard**, foster the **hedging market development**
- Prevent **market speculation and windfall effects**

Guarantees fixed-frequency interventions:

- **Certainty** about interventions: the CB can intervene with **larger amounts**, more efficient
- **Budget neutrality** with symmetric risk preference
- **Financially optimized**: always buy/sell at the best price

Framework Extends Beyond FXI triggers

- Determine FX Intervention triggers
- Conduct market monitoring and provide policy guidance
- Benchmark FX interventions, including discretionary interventions

Main Features … Conditional VaR FXI Rule

The VaR-based rule could be considered **as one option** to improve the rules that central banks currently use for FXI …

. . . Some central banks might be reluctant to use a VaR-rule:

- **more difficult to communicate** to the public
- However, FXI occur in the wholesale FX market, where market participants are fully aware of the VaR concept

… Some policymakers might prefer to keep discretion over FXI, Trade-off:

- a transparent rule anchors better market expectations, central bank credibility
- maximize efficiency and strengthen central bank's independence

Thank You

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