

Country Risk Report

A Quarterly Guide to Country Risks

September 2019

(Data as of August 31)

Summary

Country Risk

Ratings agencies

- **Argentina has gone through a series of downgrades and upgrades** after falling into a technical default due to the announcement of postponing payments on its short-term debt and other measures. **Other rating agencies changes continue to be concentrated on Emerging Markets (EM)** →

Financial Markets

- **Note worthy compression of sovereign spreads across the board. Median sovereign CDS has reached its lowest level since 2008.** Greece and Portugal CDS have reached levels not seen since 2009, before EU Periphery's sovereign crisis erupted →
- **The tightening of sovereign spreads have reduced downgrade pressures** and intensified upgrade pressures across the board, especially in EM Europe and EU Periphery. Markets are highly positive on Portugal and Thailand →
- **Financial stress increased sharply in August across the board, after two months of relaxation. The spike has been more intense in USA, Europe and LatAm** with a new jump in equities' volatility in and a surge in interest rates tensions in US, lead by the escalation of trade tensions and disappointing economic data →

BBVA Research

- **Sovereign CDS spreads in LatAm and EM Asia continue widening their gap with respect to our estimated equilibrium spread level**, driven by the search for yield, as markets seem to be ignoring their fiscal vulnerabilities →
- **High financial vulnerabilities such as excess private leverage and housing prices continue to be concentrated in some advanced economies, especially in northern European countries** and countries from the **Anglosphere** (Canada, Denmark, Belgium, Netherlands, Sweden, Australia) **and in China in EM. However, those same advanced economies tend to show rather low fiscal vulnerabilities** → →
- **Meanwhile, financial vulnerabilities have been decreasing throughout all other regions**, such as Turkey, HK and several EM economies, who until recently showed important disequilibria. **In contrast, fiscal vulnerabilities seem to be high and either worsening or not improving throughout most regions**, specially in LatAm, and to a lesser extent, in EM Asia → →

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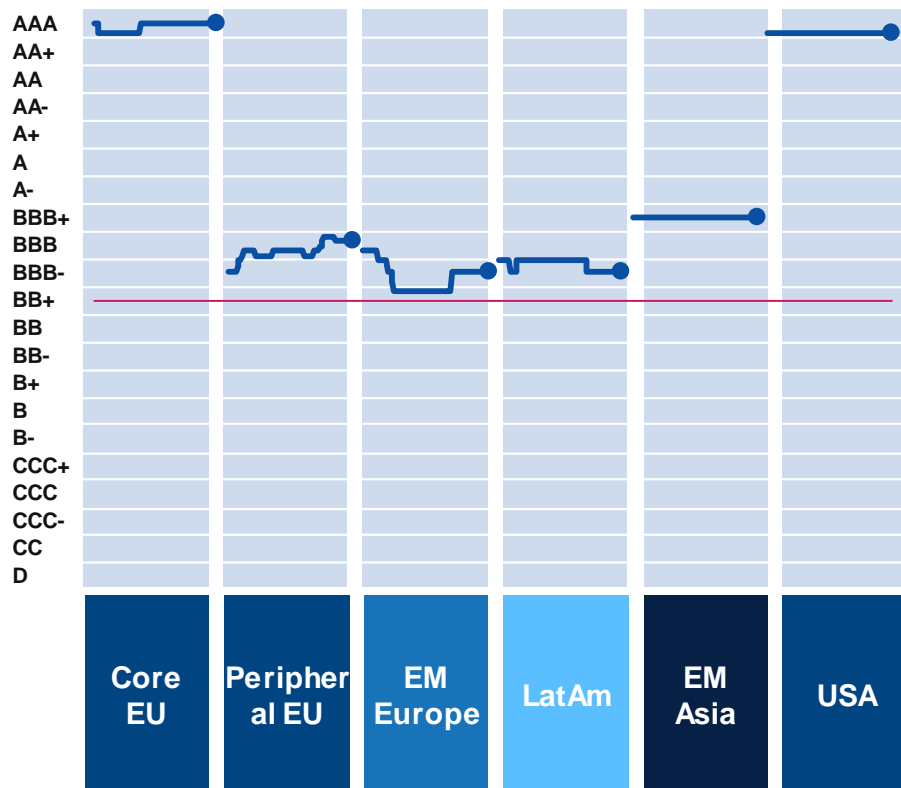
Sovereign Markets and Ratings Update

Evolution of sovereign CDS by country
Evolution of sovereign ratings
Market downgrade/upgrade pressure

Sovereign markets and rating agencies update

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SOVEREIGN RATING INDEX 2013-19



- The changes from rating agencies continue to be concentrated on Emerging Markets (EM)
- **Slovenia** was upgraded by S&Ps and Fitch, and **Russia** by S&Ps.
- **Argentina** was shortly downgraded to Restricted Default (RD) by Fitch and Selective Default by S&Ps in August, but upgraded again soon after, although in both cases to a much lower rating than before, while Moody's also downgraded it by several notches.
- **Turkey** was downgraded by Fitch

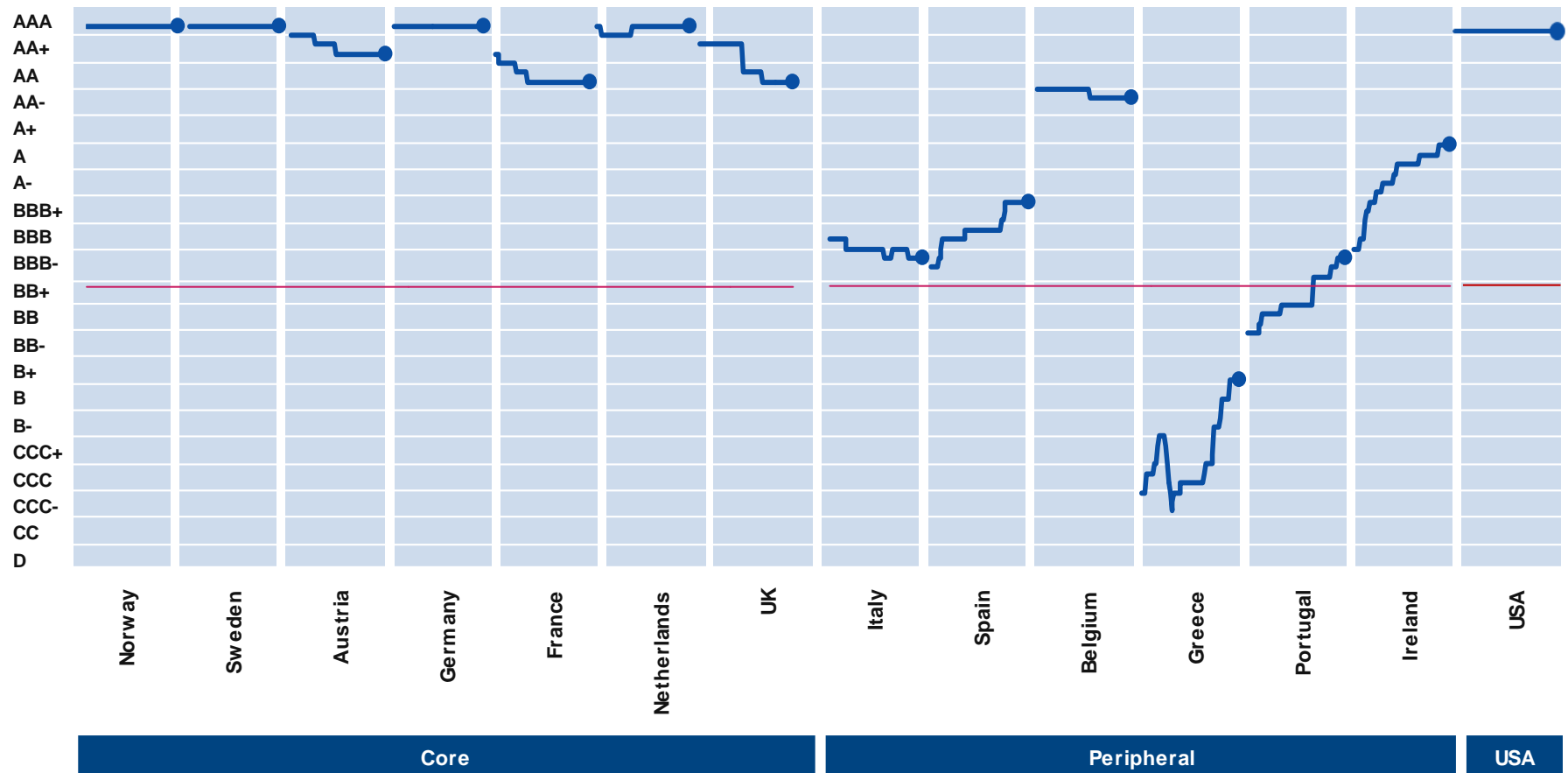
Sovereign Rating Index: An index that translates the three important rating agencies ratings letters codes (Moody's, Standard & Poors and Fitch) to numerical positions from 20 (AAA) to default (0). The index shows the average of the three rescaled numerical ratings.

Source: BBVA Research by using S&P, Moody's and Fitch data

Sovereign markets and rating agencies update

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SOVEREIGN RATING INDEX 2013-19: DEVELOPED MARKETS

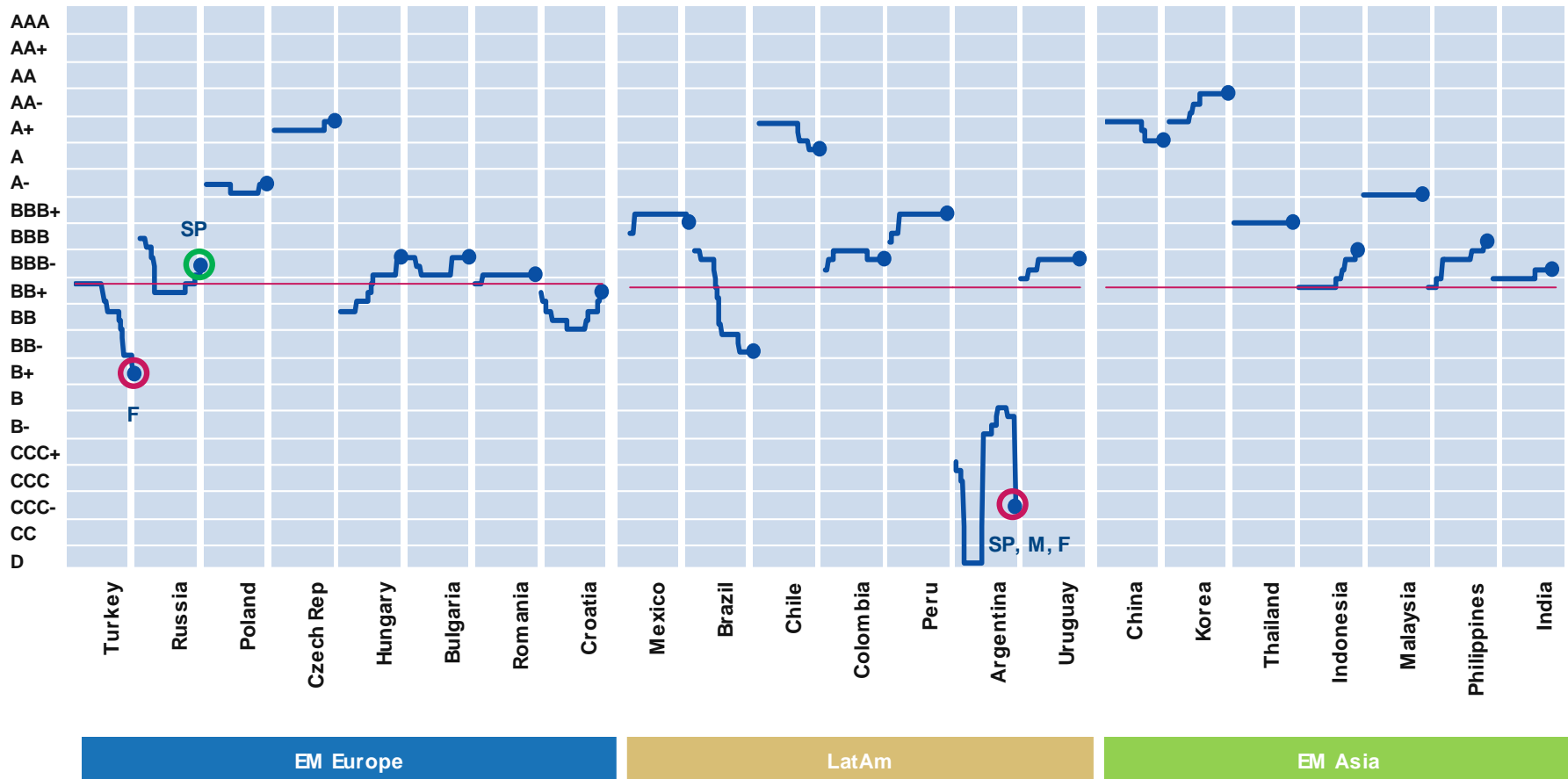


○ Downgrade ○ Upgrade **SP**: Standard & Poor's **M**: Moody's **F**: Fitch

Sovereign markets and rating agencies update

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SOVEREIGN RATING INDEX 2013-19: EMERGING MARKETS

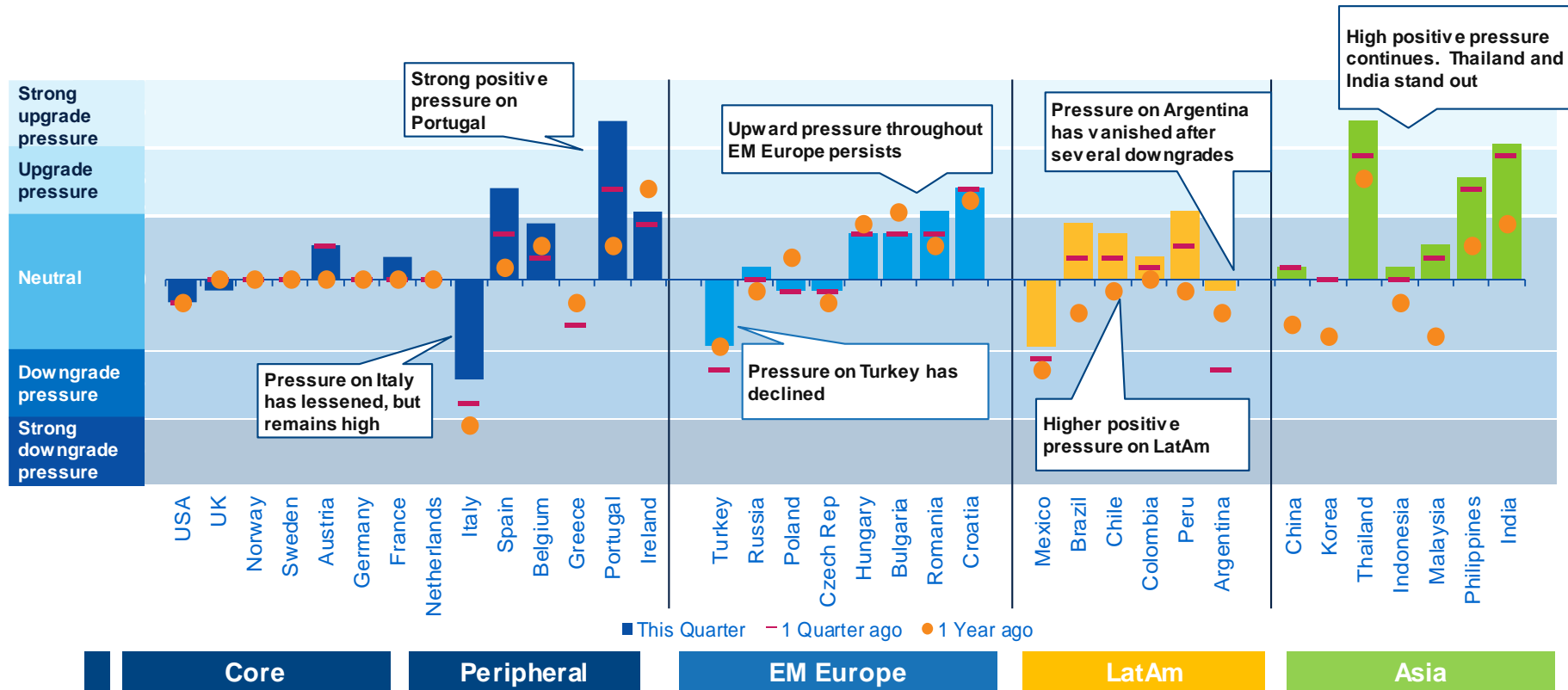


○ Downgrade ○ Upgrade **SP**: Standard & Poor's **M**: Moody's **F**: Fitch

Sovereign markets and rating agencies update

MARKETS VS. RATINGS PRESSURE GAP (LAST DATE: AUGUST 31, 2019)

(Difference between CDS-implied rating and actual sovereign rating, in notches, quarterly average)



Source: BBVA Research

The tightening of sovereign spreads have reduced downgrade pressures and intensified upgrade pressures across the board, especially in EM and EU Periphery. Markets are highly positive on Portugal and Thailand

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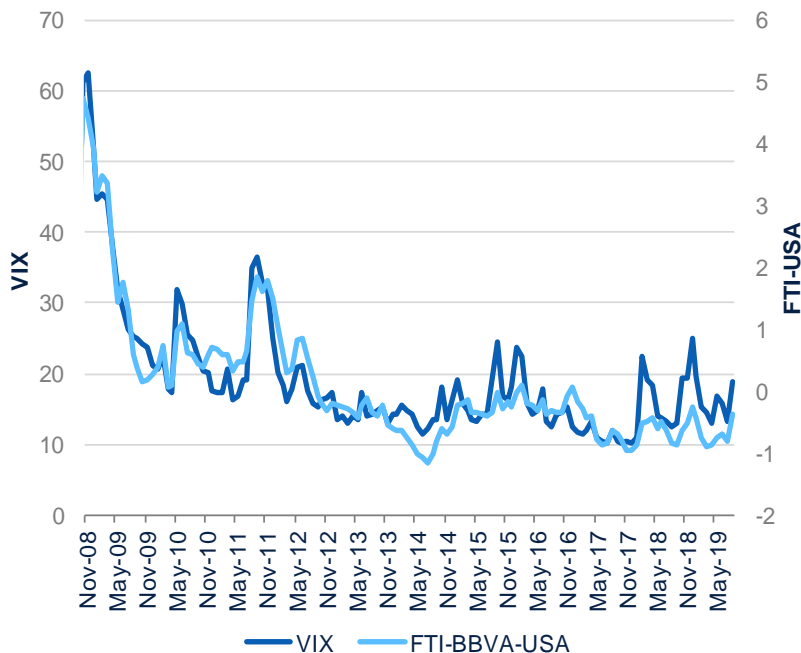
Financial Markets, Financial Tensions and Global Risk Aversion

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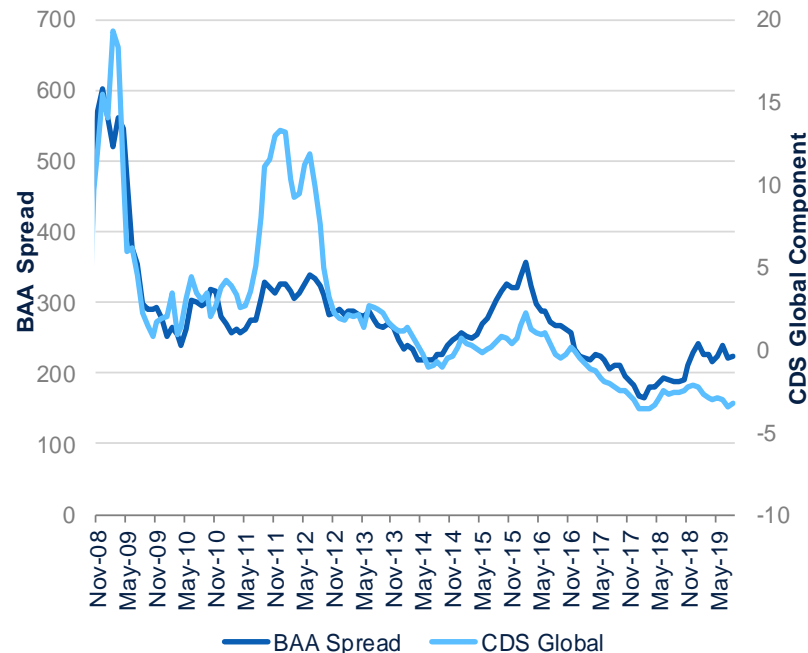
Financial Tensions and Global Risk Aversion (GRA)

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GLOBAL RISK AVERSION INDICATORS: VIX & FTI
(Monthly Average)



GLOBAL RISK AVERSION INDICATORS: BAA SPREAD & GLOBAL COMPONENT IN SOVEREIGN CDS
(Monthly Average)



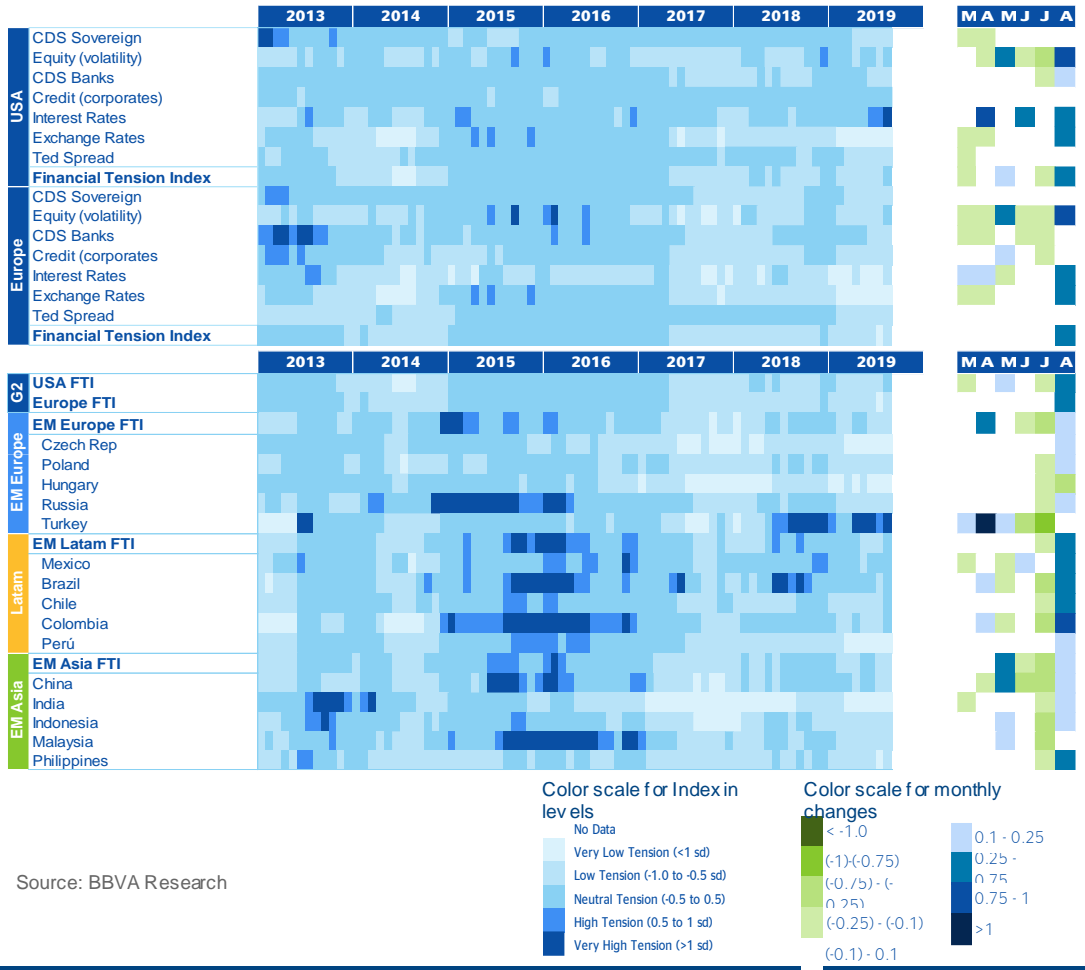
* The global component of sovereign CDS corresponds to the first component from a PCA Analysis on 51 CDS from both EMs and DMS
Source: FED, Datastream and BBVA Research

Source: Bloomberg and BBVA Research

Although there was a spike in VIX and in USA Financial Tensions Index FTI-USA in August, sovereign CDS (global component) and corporate spreads (BAA) did not respond in the same way and rather decreased or remain stable.

Financial tensions (FT) and global risk aversion (GRA)

BBVA RESEARCH FINANCIAL STRESS MAP (Monthly average, up until August 31)



Source: BBVA Research

- August saw a new jump in volatility in equity in US and Europe, and a surge in interest rates tensions in US lead by the escalation in trade tensions and disappointing economic data
- The high level of Financial Tensions in Turkey represents a clear exception within EM Europe
- LatAm is the region where FT have deteriorated the most during August
- Tensions in EM Asia continue to be low and has not feel much contagion from US or Europe

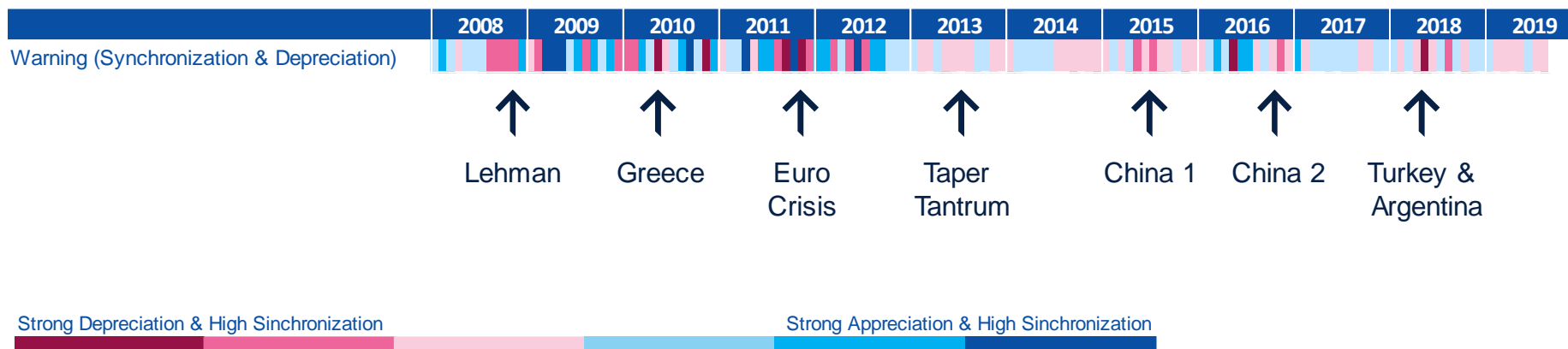
Financial stress increased in August across the board, after two months of relaxation. The spike has been more intense in USA, Europe and LatAm

EMs FX Synchronization Indicator

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SYNCHRONIZATION OF EMS FX CHANGES

Warning indicator based on Median EM FX changes and Synchronization Indicator



Based on our estimated FX Synchronization index and the median change in EM markets currencies, our warning indicator takes the maximum value when (on average) EM FX rates are depreciating strongly and there is a high degree of synchronization (intense red). On the other hand, the minimum value of the warning index occurs when on average FX rates are appreciating strongly and in a synchronized fashion (intense blue). The intermediate colors include several possible combinations of lower levels of depreciation/appreciation and/or lower degrees of synchronization.

Source: BBVA Research

August has seen a strong depreciation of some EM FX currencies. However, there has been a low synchronization level and thus, our warning indicator remains low

03

Macroeconomic vulnerability and in-house regional country risk assessment

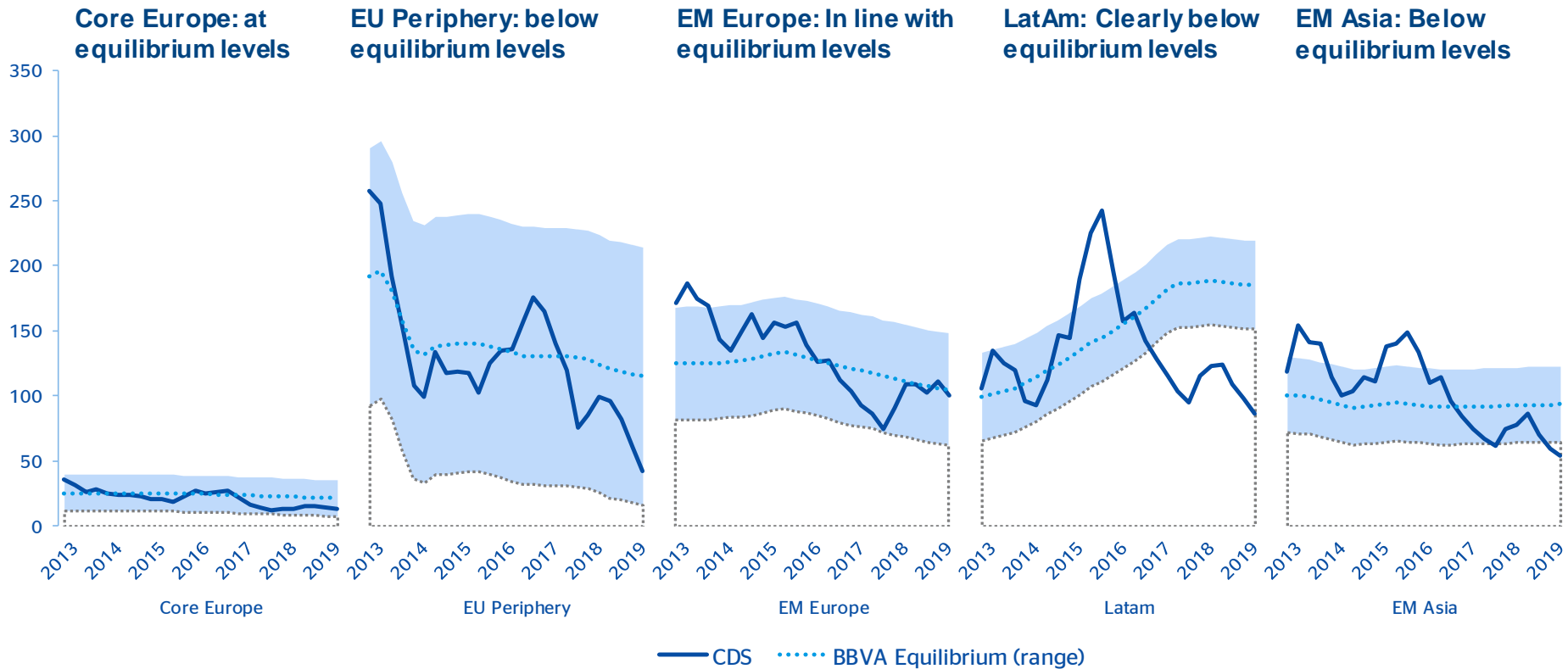
BBVA-Research sovereign ratings by regions

Equilibrium CDS by regions

Vulnerability Radars by regions

Macroeconomic Vulnerability and Risk Assessment

CDS AND EQUILIBRIUM RISK PREMIUM: AUGUST 2019



Periphery UE excludes Greece; Latam includes: Brazil, Chile, Colombia, Mexico and Peru. It excludes Argentina and Venezuela.
 Source: BBVA Research and Datastream

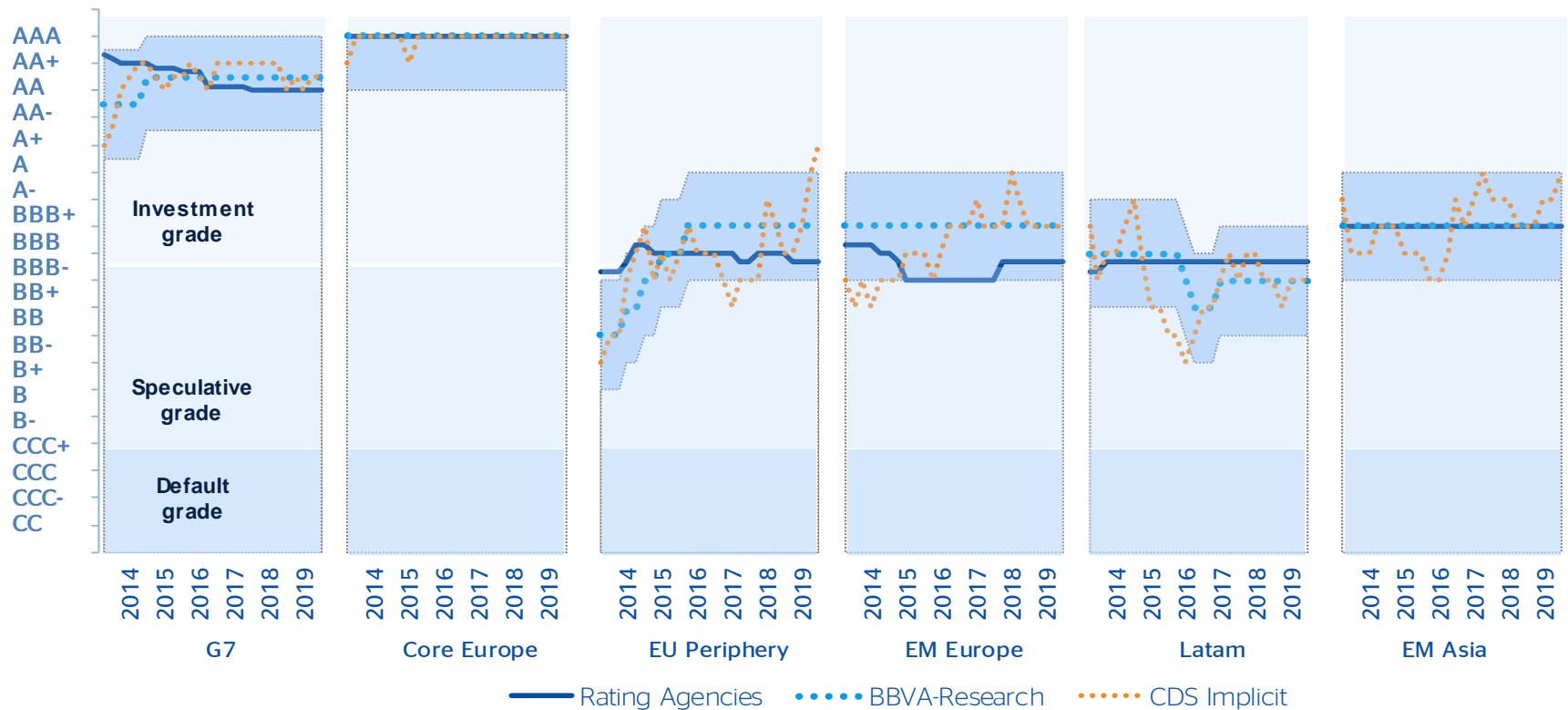
Sovereign CDS spreads in LatAm and EM Asia continue widening their gap with respect to our estimated equilibrium spread level, driven by the search for yield, regardless of their fiscal vulnerabilities

Macroeconomic Vulnerability and Risk Assessment

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AGENCIES' SOVEREIGN RATING VS. BBVA RESEARCH RATING AND MARKET'S IMPLICIT RATING

Median Agencies' Rating, BBVA's rating average (+/-1 std. dev.) and CDS implicit rating



Latam includes: Argentina, Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay and Venezuela. CDS implicit rating excludes Argentina and Venezuela.
Source: Standard & Poor's, Moody's, Fitch & BBVA Research

Our median ratings remain stable in the last quarter for all regions. Markets are more positive than rating agencies on EM Europe and EM Asia, and far more positive on EU Periphery

Macroeconomic Vulnerability and Risk Assessment

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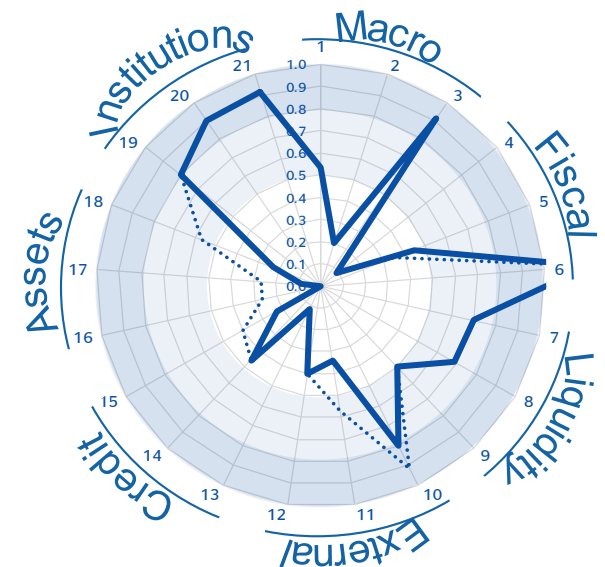
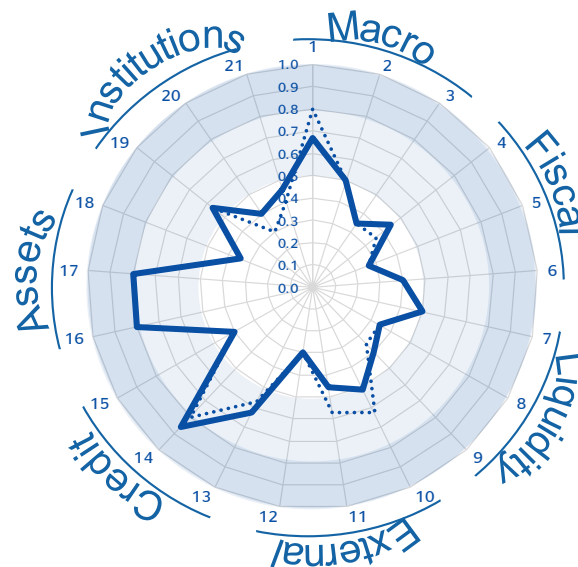
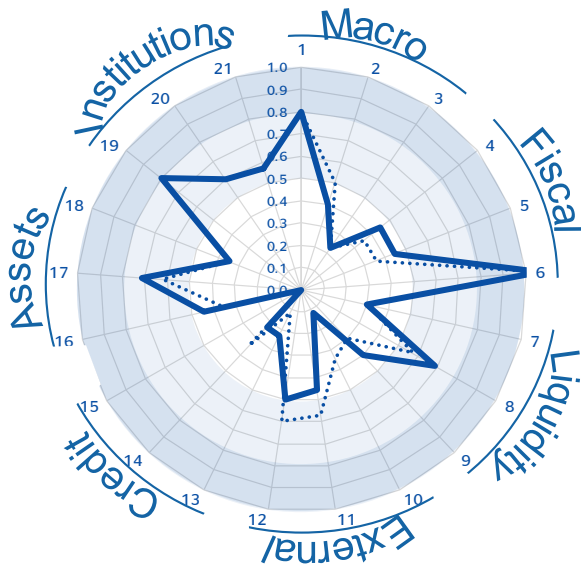
DEVELOPED MARKETS: VULNERABILITY RADAR 2019

(Relative position for the developed countries. Risk equal to threshold=0,8, Min risk=0. Previous year data is shown as a dotted line)

G7: High levels of public debt and weak economic growth continue to be the main vulnerabilities

Core Europe: Private and Corporate leverage, and Housing Prices are the main vulnerabilities. However, it is the region with the lowest fiscal vulnerability

Periphery EU: Unemployment, public & external debt levels and institutional risks remain as highest vulnerabilities. Private leverage vulnerabilities continue improving



Macro: (1) GDP (% YoY) (2) Prices (% YoY) (3) Unemployment (% LF).

Fiscal: (4) Structural balance (%) (5) Interest rate – GDP %YoY (6) Public debt (% GDP).

Liquidity: (7) Debt by non-residents (%total) (8) Financial needs (%GDP) (9) Financial pressure (% GDP).

External: (10) External debt (%GDP) (11) RER appreciation (%YoY) (12) CAC balance (%GDP).

Credit: (13) Household (%GDP) (14) Corporate (%GDP) (15) Credit-to-deposit (%).

Assets: (16) Private credit Gap (%GDP) (17) Housing Prices Gap (%GDP) (18) Equity (%).

Institutions*: (19) Political stability (20) Corruption (21) Rule of law . (*relative position of each group vis-à-vis the Developed/Emerging regions as a whole)

High risk

Moderate Risk

Safe

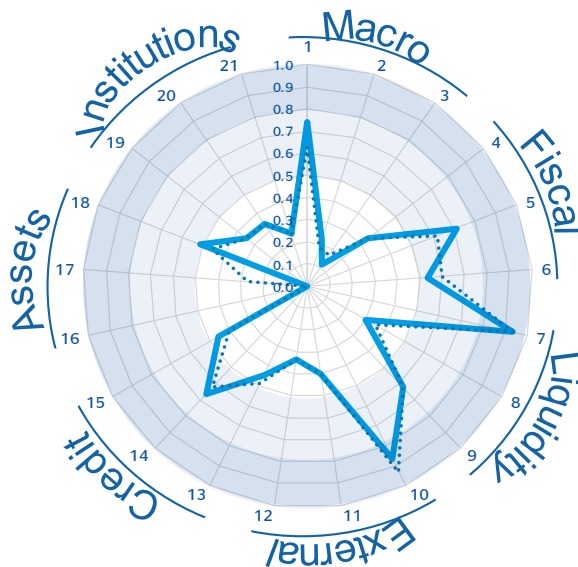
Macroeconomic Vulnerability and Risk Assessment

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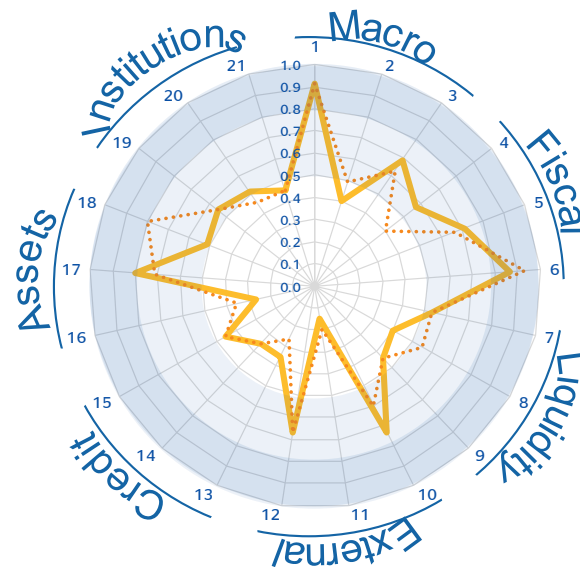
EMERGING MARKETS: VULNERABILITY RADAR 2019

(Relative position for the emerging countries. Risk equal to threshold=0,8, Min risk=0. Previous year data is shown as a dotted line)

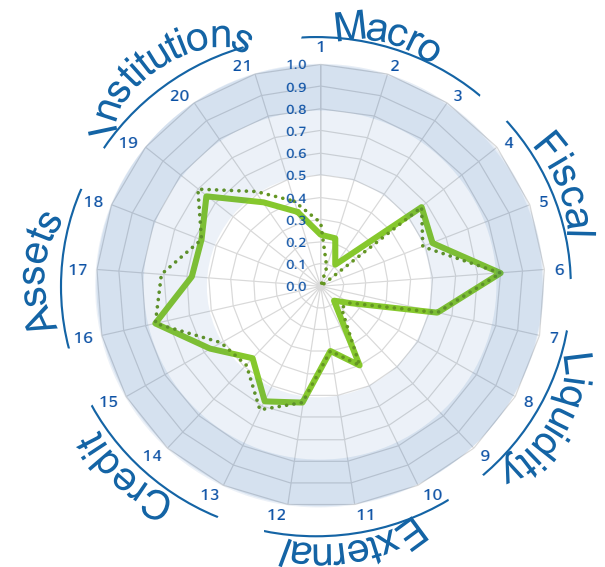
EM Europe: High vulnerabilities in external debt and debt held by non-residents. Other vulnerabilities are contained and remain unchanged



LatAm: Low growth and public debt levels stand out and continue to be the highest vulnerabilities. Other fiscal vulnerabilities keep on worsening



EM Asia: Private leverage vulnerabilities keep on improving (including corporates & households). Fiscal vulnerabilities worsening slightly



Macro: (1) GDP (% YoY) (2) Prices (% YoY) (3) Unemployment (% LF).

Fiscal: (4) Structural balance (%) (5) Interest rate – GDP %YoY (6) Public debt (% GDP).

Liquidity: (7) Debt by non-residents (%total) (8) Financial needs (%GDP) (9) Financial pressure (% GDP).

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■ High risk

■ Moderate Risk

■ Safe

04

Assessment of financial and external disequilibria

Private credit gaps by country

Housing prices gaps by country

Early warning system of banking crises by regions

Early warning system of currency crises by regions

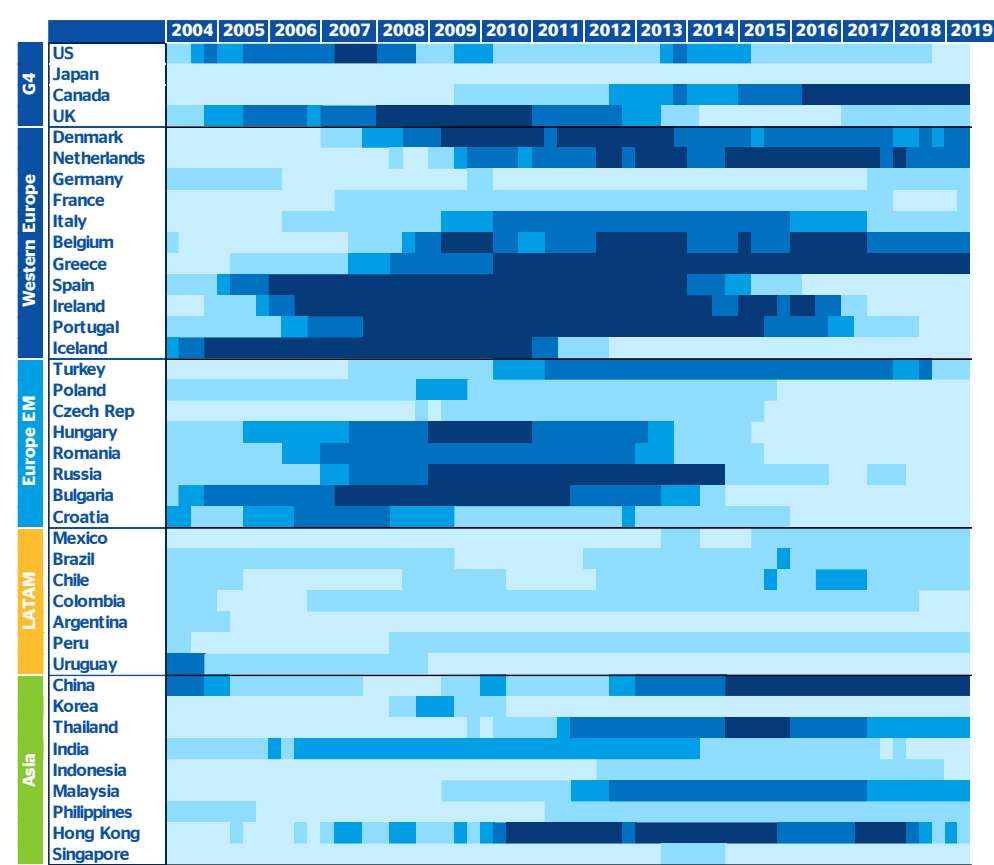
Assessment of financial and external disequilibria

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Private leverage imbalances continue to be concentrated in some advanced economies (Canada, Belgium, Denmark, Netherlands) and in China in EM. Turkey and HK excess leverage keeps on decreasing

PRIVATE DEBT GAPS COLOR MAP (2004-2019 Q2)

Gap between private debt-to-GDP ratio and its long-term structural trend

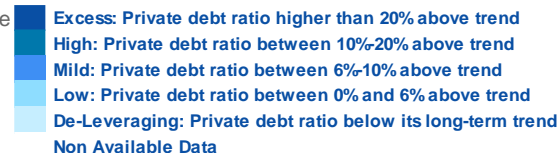


- Private leverage disequilibrium continues to be quite high in Canada, while is currently negative in USA and Japan
- Although most countries in Europe are currently deleveraging, private debt levels continues to be above fundamentals in Denmark, Netherlands, Belgium and Greece
- Private Debt-to-GDP ratio keeps decreasing in Turkey, bringing its gap close to zero. Other EM Europe countries maintain their deleveraging processes and leverage below their structural levels
- Debt ratio levels in LatAm continue to be close to or below their structural trends
- Private leverage growth in China continues, maintaining the gap vs. its equilibrium levels. On the contrary, HK leverage keeps on decreasing and closing its gap to its trend. Some signs of disequilibria can be still be seen in Thailand

The methodology for estimating debtgaps could be found at: <https://goo.gl/LTeTHD>.

<https://goo.gl/r0BLbl>

Source: IFS, BIS & BBVA Research



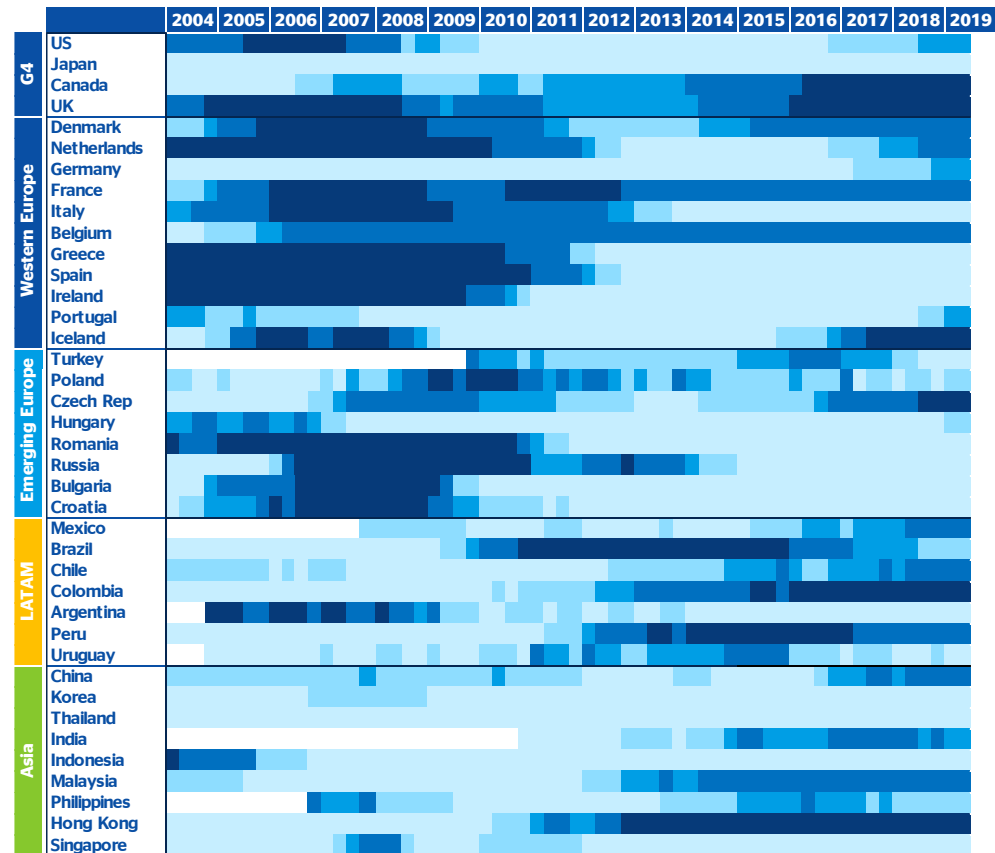
Assessment of financial and external disequilibria

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Housing prices gaps point to high imbalances in several countries that also have clear vulnerabilities in their credit markets, such as Canada and China. Price disequilibrium in Turkey continues improving, while in UK and HK continues to be high

REAL HOUSING PRICES GAPS COLOR MAP (2004-2019 Q2)

Gap between housing prices and its long-term structural trend



- Housing prices gaps remain high in Canada and UK (the former coincides with a high credit-gap), and keeps on growing in US
- The gap is also high in Denmark, Netherlands, France and Iceland, while signs of excess are growing in Germany and Portugal
- Real price levels appear to be excessive in Czech Republic, while the gap is now well into negative territory in Turkey and remain low in the rest of the region
- Prices gaps in Colombia signal a clear excess, and to a lesser extent in Chile, Mexico and Peru.
- Hong Kong property price gap shows a clearly excess level. Prices in China and Malaysia also remain high with respect to their trends

* <https://goo.gl/xXj3Gm>

Source: BBVA Research, BIS, Haver and Oxford Economics

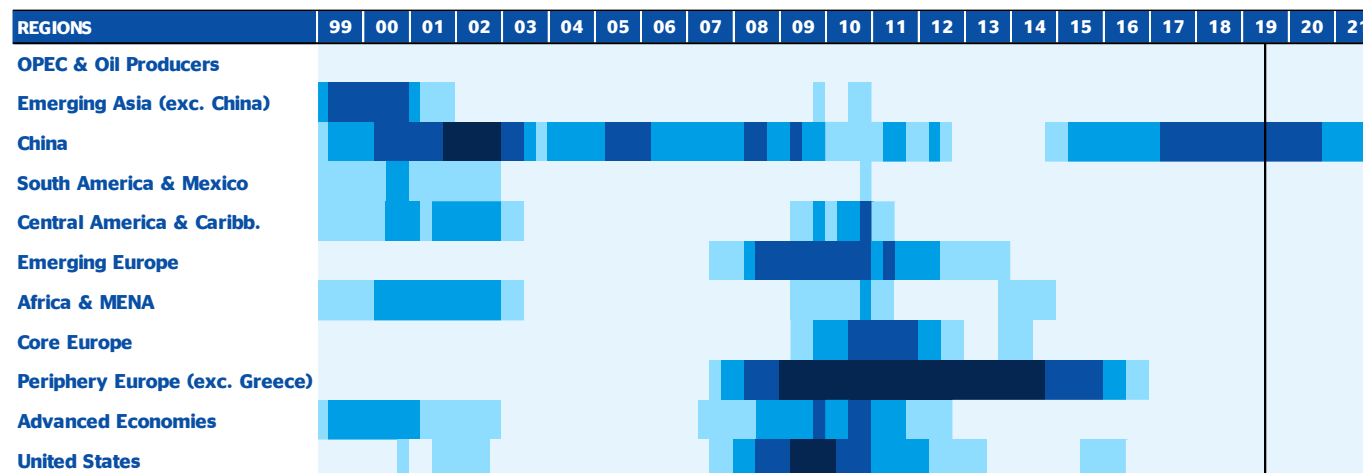
■ Excess: Real house prices higher than 20% above trend
 ■ High: Real house prices between 10%-20% above trend
 ■ Mild: Real house prices between 6%-10% above trend
 ■ Low: Real house prices between 0% and 6% above trend
 ■ De-Leveraging: Real house prices below its long-term trend
 ■ Non Available Data

Assessment of financial and external disequilibria

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EARLY WARNING SYSTEM (EWS) OF BANKING CRISES (1999Q1-2021Q4)

(Probability of Systemic Banking Crisis (based on 8-quarters lagged data*):



● The likelihood of a future banking crisis in China has not improved in the most recent quarters



- A banking crisis in a given country follows the definition by Laeven and Valencia (2012), which is shown in the Appendix
- The complete description of the methodology can be found at <https://goo.gl/r0BLbl> and at <https://goo.gl/VA8xXv>
- The probabilities shown are the simple average of the estimated individual countries probabilities for each region. The definition of each region is shown in the Appendix

* The probability of a crisis in Q4-2016 is based on Q4-2014 data.
Source: BBVA Research

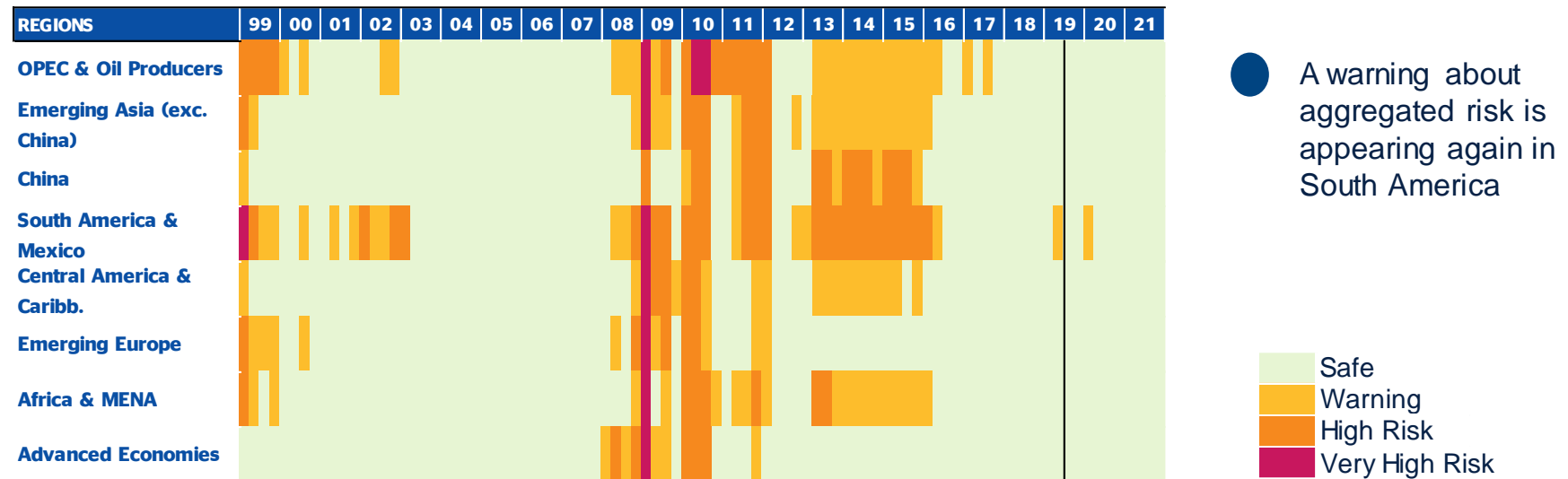
On average, no region is showing an aggregated excess in their banking sector that signals a high probability of a banking crisis. However, several countries within these regions, and China, continue to show a high vulnerability

Assessment of financial and external disequilibria

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EARLY WARNING SYSTEM (EWS) OF CURRENCY CRISIS RISK: PROBABILITY OF CURRENCY TENSIONS

The probability of a crisis is based on 4-quarters lagged data, e.g. Probability in Q4-2016 is based on Q4-2015 data



- Our Currency-Crises Early Warning System EWS allows us to estimate the probability of a currency crisis, which is defined as a “large” fall in the exchange rate and in foreign reserves in a given country, according to certain predefined measures.
- The probabilities shown in the table are the simple average of the individual countries probabilities for each region. The list of the leading indicators used in the estimation of the probability and the definition of each region are shown in the Appendix.

Source: BBVA Research

As our EWS has suggested, exchange rate tensions have erupted in some specific countries, but have not extended to whole geographic regions. Risks continue to be idiosyncratic, although some warning is showing up in South America

Vulnerability Indicators table by country

Vulnerability Indicators Table

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VULNERABILITY INDICATORS* 2019: DEVELOPED MARKETS

	Fiscal sustainability			External sustainability			Liquidity management			Macroeconomic performance			Credit and housing			Private debt			Institutional		
	Structural primary balance (1)	Interest rate GDP growth differential 2016-21	Gross public debt (1)	Current account balance (1)	External debt (1)	RER appreciation (2)	Gross financial needs (1)	Short-term public debt (3)	Debt held by non-residents (3)	GDP growth (4)	Consumer prices (4)	Unemployment rate (5)	Private credit to GDP growth (4)	Real housing prices growth (4)	Equity markets growth (4)	Household debt (1)	NF corporate debt (1)	Financial liquidity (6)	WB political stability (7)	WB control corruption (7)	WB rule of law (7)
United States	-3.1	-1.5	105.0	-2.5	94.8	1.3	25.1	18.0	29.4	2.5	1.7	3.7	-8.7	7.1	9.6	75.1	74.4	66.7	-0.3	-1.4	-1.6
Canada	0.1	0.6	88.0	-3.1	116.9	-0.4	9.6	10.3	25.9	1.5	1.8	5.9	27.7	30.3	0.6	99.6	110.5	128.4	-1.1	-1.9	-1.8
Japan	-2.8	-0.7	237.5	3.5	75.5	2.0	39.5	15.9	10.5	1.0	1.7	2.4	-14.1	-30.3	-4.6	58.1	103.5	48.9	-1.1	-1.5	-1.6
Australia	0.0	-1.2	41.1	-2.1	112.2	-5.4	3.0	4.4	44.3	2.1	2.3	4.8	15.4	14.5	6.5	118.2	75.4	132.4	-0.9	-1.8	-1.7
Korea	2.1	-1.0	40.5	4.6	27.9	-3.8	-0.1	7.7	13.1	2.6	1.4	4.0	-20.9	-7.7	-8.4	93.4	96.0	98.6	-0.3	-0.5	-1.2
Norway	-9.6	-1.9	36.8	7.4	147.3	0.5	-8.7	0.2	49.1	2.0	1.6	3.7	15.9	28.6	-1.9	98.9	138.5	154.0	-1.2	-2.2	-2.0
Sweden	0.3	-2.8	37.2	2.4	166.7	-5.9	3.7	10.2	38.0	1.2	1.8	6.3	15.5	35.1	4.1	88.4	153.1	180.0	-1.0	-2.1	-1.9
Denmark	-0.3	0.2	33.6	5.5	158.5	-0.5	4.4	13.5	37.9	1.7	1.2	4.9	24.9	18.1	4.2	114.4	124.7	304.8	-0.9	-2.2	-1.9
Finland	-0.7	-1.6	59.9	0.1	158.5	0.3	6.0	10.4	80.7	1.9	1.4	7.2	23.4	9.9	-6.5	66.7	114.0	137.9	-1.1	-2.2	-2.0
UK	0.1	-0.8	85.7	-4.2	306.3	-3.9	9.5	8.4	37.0	1.2	1.8	4.2	9.4	22.0	-2.8	86.7	78.8	58.6	-0.3	-1.8	-1.7
Austria	0.6	-1.6	71.2	2.0	161.3	1.0	7.7	7.9	80.9	2.0	1.9	5.1	-10.5	21.5	-8.5	50.6	95.7	93.9	-1.0	-1.5	-1.8
France	-1.0	-1.3	99.2	-0.4	217.0	0.3	13.5	7.7	61.1	1.3	1.2	8.8	0.0	15.4	4.0	59.8	141.5	107.8	-0.2	-1.3	-1.4
Germany	1.9	-2.0	56.9	7.1	137.9	0.8	3.5	8.7	53.9	0.8	1.6	3.4	3.3	9.5	0.8	54.5	57.6	89.0	-0.6	-1.8	-1.6
Netherlands	1.3	-1.7	52.0	9.3	501.8	1.6	5.1	14.3	48.0	1.8	2.0	3.7	20.3	12.8	1.8	98.6	168.4	101.3	-0.9	-1.9	-1.8
Belgium	1.1	-1.1	99.6	0.3	228.3	1.3	17.0	16.3	63.6	1.3	1.3	5.9	21.9	13.4	-3.1	61.6	157.7	58.1	-0.4	-1.5	-1.3
Italy	1.8	1.1	133.4	2.9	113.3	-0.4	23.7	15.2	37.0	0.1	0.8	10.7	5.9	-12.5	-1.8	40.6	70.7	87.6	-0.2	-0.2	-0.3
Spain	-0.4	-0.9	85.2	0.8	161.7	0.2	16.7	15.0	52.4	2.3	0.8	13.4	-21.7	-6.1	-4.4	58.7	93.1	92.4	-0.3	-0.5	-1.0
Ireland	1.2	-2.8	62.4	9.1	741.3	-1.0	7.2	10.8	70.3	4.1	0.4	5.3	-29.4	-5.4	-11.9	42.8	192.0	49.3	-1.0	-1.5	-1.4
Portugal	2.6	-0.3	119.5	-0.4	208.9	-0.6	14.4	10.3	61.8	1.7	4.0	6.8	-4.6	8.9	-2.3	66.5	99.3	102.1	-1.1	-0.9	-1.1
Greece	6.3	-1.8	174.2	-2.7	207.9	-0.8	14.5	8.3	81.5	2.4	0.8	18.5	26.1	-20.0	14.6	53.2	59.7	109.2	0.1	0.1	-0.1

*Vulnerability indicators: (1) % GDP. (2) Deviation from four-year average. (3) % of total debt. (4) % year on year. (5) % of Total labour force. (6) Financial system credit to deposit. (7) Index by World Bank governance indicators.

Source: BBVA Research, Haver, BIS, IMF and World Bank

Vulnerability Indicators Table

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VULNERABILITY INDICATORS* 2019: EMERGING MARKETS

	Fiscal sustainability		External sustainability			Liquidity management			Macroeconomic performance			Credit and housing			Private debt			Institutional			
	Structural primary balance (1)	Interest rate GDP growth differential 2016-21	Gross public debt (1)	Current account balance (1)	External debt (1)	RER appreciation (2)	Gross financial needs (1)	Reserves to short-term external debt (3)	Debt held by non-residents (3)	GDP growth (4)	Consumer prices (4)	Unemployment rate (5)	Private credit to GDP growth (4)	Real housing prices growth (4)	Equity markets growth (4)	Household debt (1)	NF corporate debt (1)	Financial liquidity (6)	WB political stability (7)	WB control corruption (7)	WB rule of law (7)
Bulgaria	-0.5	0.4	19.3	1.9	65.4	3.9	3.5	1.7	44.4	3.3	2.2	5.0	-26.4	-21.7	-7.3	20.2	76.6	72.4	-0.4	0.2	0.0
Czech Rep	1.8	-1.3	31.6	-0.6	69.1	5.4	3.3	22.3	50.4	2.9	2.1	3.1	-4.7	23.2	-2.1	32.1	56.2	80.7	-1.0	-0.6	-1.1
Croatia	2.3	-1.0	70.7	2.1	72.1	1.1	8.7	3.0	40.2	2.6	1.2	9.0	-9.6	-8.8	3.7	33.1	24.5	86.8	-0.7	-0.2	-0.3
Hungary	-0.5	-2.2	66.6	0.5	98.1	1.0	15.5	1.1	43.7	3.6	3.5	3.5	-18.9	1.3	11.5	17.2	86.1	87.0	-0.8	-0.1	-0.5
Poland	-0.1	-1.5	47.5	-1.2	62.9	2.2	7.9	1.7	55.1	3.8	2.3	3.6	-7.6	2.1	7.6	34.6	85.9	105.1	-0.5	-0.7	-0.5
Romania	-2.4	-2.3	38.0	-5.2	46.4	1.9	8.0	1.5	51.9	3.1	3.5	4.8	-17.5	-17.6	9.0	15.7	31.8	79.2	-0.1	0.0	-0.4
Russia	3.4	0.9	13.8	5.7	22.6	4.1	0.4	5.6	22.7	1.6	4.8	4.8	-3.5	-31.9	20.5	18.0	45.1	107.5	0.7	0.9	0.8
Turkey	-2.9	-1.7	29.9	0.7	48.0	0.6	7.1	0.6	38.8	0.3	16.3	13.8	5.1	-12.0	0.0	13.4	65.4	112.9	1.8	0.2	0.3
Argentina	-0.5	-10.7	80.7	-2.1	80.7	-16.8	17.1	0.8	48.1	-2.5	53.0	10.6	-2.6	-29.1	60.5	5.7	16.6	77.9	-0.2	0.3	0.2
Brazil	-0.6	1.8	90.4	-1.7	36.3	-2.8	15.0	3.5	8.7	2.1	3.9	11.4	1.7	1.7	38.8	28.2	41.7	86.7	0.4	0.5	0.3
Chile	-1.1	-1.8	27.2	-3.2	62.7	-1.9	2.4	1.7	30.3	3.4	2.7	6.5	5.3	14.0	-4.3	45.5	96.1	159.3	-0.4	-1.0	-1.0
Colombia	0.7	-0.2	51.4	-4.4	41.3	-3.0	4.9	2.5	30.9	3.0	3.6	11.0	-1.8	26.2	0.9	27.5	35.0	120.5	0.8	0.4	0.4
Mexico	1.7	1.7	54.1	-1.7	36.9	2.5	10.1	2.7	30.6	0.7	3.7	3.2	1.0	14.5	-11.9	16.0	24.8	89.0	0.6	0.9	0.6
Peru	-0.8	-0.2	27.2	-1.4	29.0	1.0	4.4	6.9	31.0	2.5	2.2	6.2	3.4	17.7	4.2	16.8	36.2	114.8	0.3	0.5	0.5
China	-3.8	-5.4	75.4	0.4	12.9	-2.2	4.4	3.5	..	6.3	2.2	3.8	31.9	11.3	-2.1	59.9	149.5	97.1	0.3	0.3	0.3
India	-1.8	-3.6	69.0	-2.5	20.1	1.0	10.7	3.6	5.9	7.3	4.1	5.6	-0.1	6.1	11.2	11.2	39.4	81.8	0.8	0.2	0.0
Indonesia	0.0	-2.7	29.3	-2.7	37.3	0.5	3.8	2.1	60.7	5.2	3.6	5.2	-0.4	-34.7	9.6	16.7	23.0	103.0	0.5	0.3	0.3
Malaysia	-2.9	-2.6	56.3	2.1	60.2	-0.8	10.0	1.0	29.5	4.7	2.4	3.3	10.7	17.4	-1.1	89.8	-	112.8	-0.2	0.0	-0.4
Philippines	0.9	-3.7	39.1	-2.2	18.6	0.3	4.3	4.3	24.8	6.5	3.5	5.5	7.4	1.9	11.2	3.9	41.4	73.1	1.2	0.5	0.4
Thailand	0.4	-2.1	41.5	7.1	32.8	7.2	5.4	3.4	13.4	3.5	1.9	1.2	10.5	-6.3	8.4	70.8	45.0	100.7	0.8	0.4	0.0

*Vulnerability indicators: (1) % GDP. (2) Deviation from four-year average. (3) % of total debt. (4) % year on year. (5) % of Total labour force. (6) Financial system credit to deposit. (7) Index by World Bank governance indicators.

Source: BBVA Research, Haver, BIS, IMF and WorldBank

Methodological Appendix

Appendix

Methodology: indicators and maps

- **Financial Stress Map:** It stresses levels of stress according to the normalized time series movements. Higher positive standard units (1.5 or higher) stand for high levels of stress (dark blue) and lower standard deviations (-1.5 or below) stand for lower level of market stress (lighter colours)
- **Sovereign Rating Index:** An index that translates the letter codes of the three important rating agencies' rating (Moody's, Standard & Poor's and Fitch) to numerical positions from 20 (AAA) to default (0). The index shows the average of the three rescaled numerical ratings
- **Sovereign CD Swaps Maps:** It shows a colour map with six different ranges of CD Swaps quotes (darker >500, 300 to 500, 200 to 300, 100 to 200, 50 to 100 and the lighter below 50 bp)
- **Downgrade Pressure Gap:** The gap shows the difference between the implicit ratings according to the Credit Default Swaps and the current ratings index (numerically scaled from default (0) to AAA (20)). We calculate implicit probabilities of default (PD) from the observed CDS and the estimated equilibrium spread. For the computation of these PDs we follow a standard methodology as described in Chan-Lau (2006), and we assume a constant Loss Given Default of 0.6 (Recovery Rate equal to 0.4) for all the countries in the sample. We use the resulting PDs in a cluster analysis to classify each country at every point in time in one of 20 different categories (ratings) to emulate the same 20 categories used by the rating agencies. **From June 2019 on, the cluster analysis is performed recursively, starting with an initial sample going from Jan-2004 to Dec-2008 and adding one month at each step, generating monthly specific thresholds for determining the implicit ratings**
- The graph plots the difference between CDS-implied sovereign rating and the actual sovereign rating index, in notches. Higher positive differences account for potential Upgrade pressures and negative differences account for Downgrade potential. We consider the +/- 2 notches area as being Neutral
- **Vulnerability Radars:** A Vulnerability Radar shows a static and comparative vulnerability for different countries. For this we assigned several dimensions of vulnerabilities, each of them represented by three vulnerability indicators. The dimensions included are: Macroeconomics, Fiscal, Liquidity, External, Excess Credit and Assets, Private Balance Sheets and Institutional. Once the indicators are compiled, we reorder the countries in percentiles from 0 (lower ratio among the countries) to 1 (maximum vulnerabilities) relative to their group (Developed Economies or Emerging Markets). Furthermore, Inner positions (near 0) in the radar shows lower vulnerability, while outer positions (near 1) stand for higher vulnerability. Furthermore, we normalize each value with respect to given risk thresholds, whose values have been computed according to our own analysis or empirical literature. If the value of a variable is equal to the threshold, it would take a value of 0.8 in the radar

Appendix

Methodology: indicators and maps

Risk Thresholds Table

Vulnerability Dimensions	Risk thresholds Developed Economies	Risk thresholds Emerging Economies	Risk direction	Research
Macroeconomics				
GDP	1.5	3.0	Lower	BBVA Research
Inflation	4.0	10.0	Higher	BBVA Research
Unemployment	10.0	10.0	Higher	BBVA Research
Fiscal vulnerability				
Cyclically adjusted deficit ("Structural Deficit")	-4.2	-0.5	Lower	Baldacci et al (2011). Assessing fiscal stress. IMF WP 11/100
Expected interest rate GDP growth differential 5 years ahead	3.6	1.1	Higher	Baldacci et al (2011). Assessing fiscal stress. IMF WP 11/100
Gross public debt	73.0	43.0	Higher	Baldacci et al (2011). Assessing fiscal stress. IMF WP 11/100
Liquidity problems				
Gross financial needs	17.0	21.0	Higher	Baldacci et al (2011). Assessing fiscal stress. IMF WP 11/100
Debt held by non residents	84.0	40.0	Higher	Baldacci et al (2011). Assessing fiscal stress. IMF WP 11/101
Short term debt pressure				
Public short-term debt as % of total public debt (Developed)	9.1		Higher	Baldacci et al (2011). Assessing fiscal stress. IMF WP 11/100
Reserves to short-term debt (Emerging)		0.6	Lower	Baldacci et al (2011). Assessing fiscal stress. IMF WP 11/100
External Vulnerability				
Current account balance (% GDP)	4.0	6.0	Lower	BBVA Research
External debt (% GDP)	200.0	60.0	Higher	BBVA Research
Real exchange rate (Deviation from 4 yr average)	5.0	10.0	Higher	EU Commission (2012) and BBVA Research
Private Balance Sheets				
Household debt (% GDP)	84.0	84.0	Higher	Chechetti et al (2011). "The real effects of debt". BIS Working Paper 352 & EU Com (2012)
Non-financial corporate debt (% GDP)	90.0	90.0	Higher	Chechetti et al (2011). "The real effects of debt". BIS Working Paper 352 & EU Com (2013)
Financial liquidity (Credit/Deposits)	130.0	130.0	Higher	EU Commission (2012) and BBVA Research
Excess Credit and Assets				
Private credit to GDP gap vs trend)	12.0	12.0	Higher	BBVA Research
Real housing prices growth (gap vs trend)	12.0	12.0	Higher	BBVA Research
Equity growth (% YoY)	20.0	20.0	Higher	IMF global financial stability report
Institutions				
Political stability	0.2 (9th percentile)	-1.0 (8th percentile)	Lower	World Bank governance Indicators
Control of corruption	0.6 (9th percentile)	-0.7 (8th percentile)	Lower	World Bank governance Indicators
Rule of law	0.6 (8th percentile)	-0.6 (8th percentile)	Lower	World Bank governance Indicators

Appendix

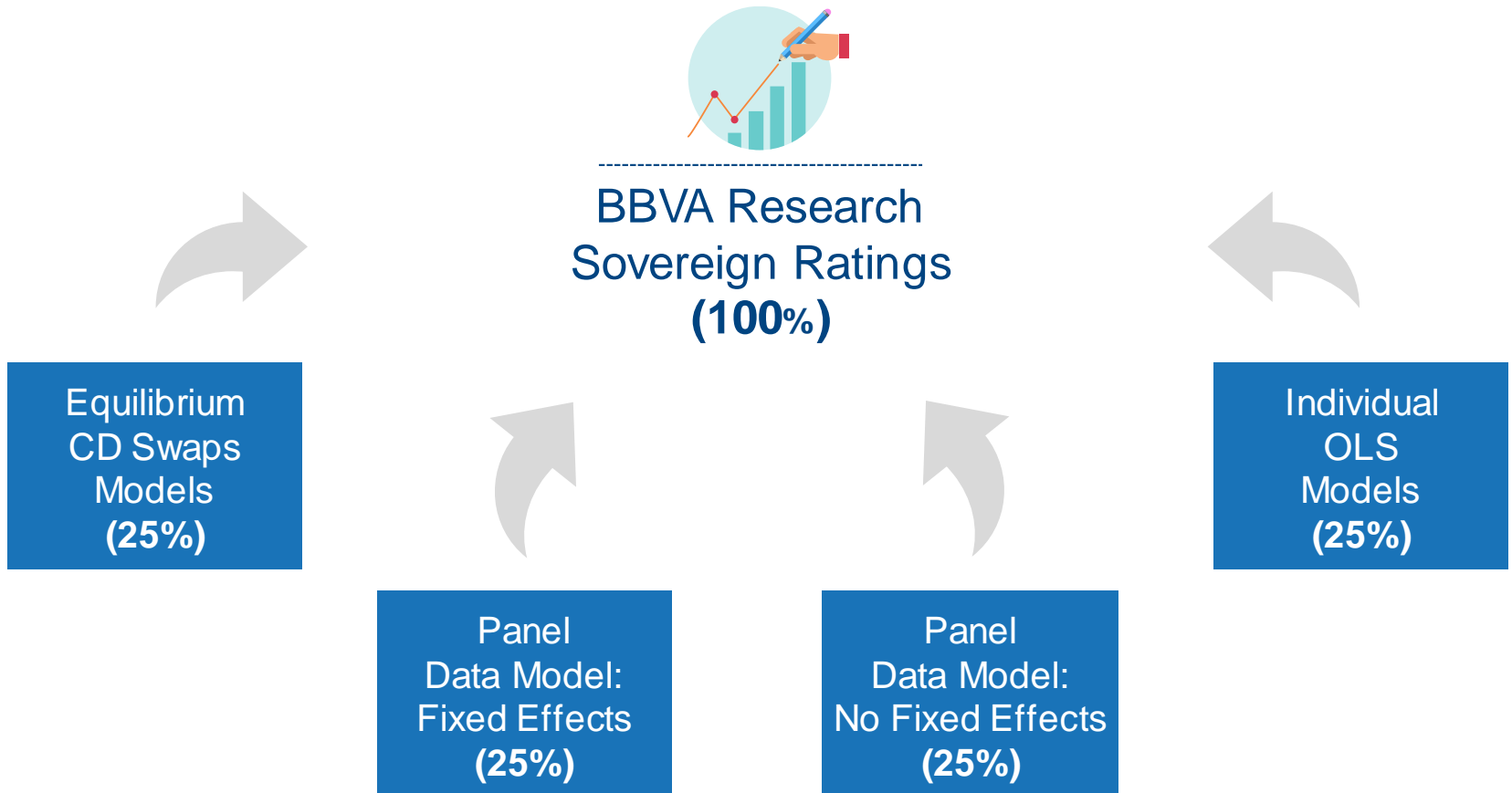
Methodology: models and BBVA country risk

- **BBVA Research sovereign ratings methodology:** We compute our sovereign ratings by averaging four alternative sovereign rating models developed at BBVA Research:
 - **Credit Default Swaps Equilibrium Panel Data Models:** This model estimates actual and forecast equilibrium levels of CDS for 48 developed and emerging countries and 10 macroeconomic explanatory variables. The CDS equilibrium is calculated using the centered 5-year moving average of the explanatory variables weighted according to their estimated sensitivities. For estimating the equilibrium level, the BAA spread is left unchanged at its long-term median level (2003-2016). The values of these equilibrium CDS are finally converted to a 20 scale sovereign rating scale.
 - **Sovereign Rating Panel Data Ordered Probit with Fixed Effects Model:** The model estimates a sovereign rating index (a 20 numerical scale index of the three sovereign rating agencies) through ordered probit panel data techniques. This model takes into account idiosyncratic fundamental stock and flows sustainability ratios allowing for fixed effects , thus including idiosyncratic country-specific effects
 - **Sovereign Rating Panel Data Ordered Probit without Fixed Effects Model:** We used the estimates of the previous model but retaining only the contribution of the macroeconomic and institutional variables, without adding the country “fixed-effect” contribution. In this way we are able to account more clearly for the effect of only those macroeconomic variables that we can identify.
 - **Sovereign Rating Individual OLS Models:** These models estimate the sovereign rating index (a 20 numerical scale index of the three sovereign rating agencies) individually. Furthermore, parameters for the different vulnerability indicators are estimated taken into account the history of the country, independent of others. The estimation comes from Oxford Economics Forecasting (OEF) for the majority of countries. For those countries that are not analysed by OEF , we estimate a similar OLS individual model.

Appendix

Methodology: models and BBVA country risk

BBVA Research sovereign ratings methodology diagram



Appendix

Methodology: Synchronization Indicator

- **Synchronization Indicator:** This indicator measures by how much all the exchange rates (against USD) in a group of 23 emerging economies are moving together during a period of 15 days (rolling window). A more extensive description of the methodology will be included in a forthcoming note. We first calculate the daily percentage change of the exchange rate of each one of the 23 countries using a daily sample of FX rates changes that goes from January-2004 to the last available date. Then, we estimate through a PCA a unique common factor using all the observations in the whole sample of 3576 days. Additionally, we also estimate the daily median of FX changes for the 23 countries (changes are standardized)
- The weights that each country has on the common factor are kept constant during the whole sample. However, we estimate in a daily fashion how much this common factor explains of the total variation in the 23 countries' FX rates (R^2) within a rolling period including the latest 15 days. We assume that the highest the R^2 the higher the Synchronization or comovement of the 23 FX rates. This moving- R^2 corresponds to the dark blue line in the graph shown in slide 19. The dotted red line corresponds to the average within the latest 15 days of the daily median change among the 23 countries
- Once we have estimated the Synchronization index and the median change in EM markets, we construct a warning indicator that takes the maximum value when (on average) EM FX rates are depreciating strongly and there is a high degree of Synchronization (intense red). On the other hand, the minimum value of the warning index occurs when on average FX rates are appreciating strongly and in a synchronized fashion (intense blue). The intermediate colors include several possible combinations of lower levels of depreciation/appreciation and/or lower degrees of Synchronization

Appendix

Methodology: Credit Gaps (Debt-to-GDP)

- **Credit Gaps (Debt-to-GDP):** The methodology is based on the idea that the long-term relationship between the Private Credit-to-GDP ratio and income per capita follows a non-linear relationship with a saturation level at the highest levels of income, i.e. a Gompertz-curve type of relationship. Thus we assume the following relationship between the credit ratio and income per capita:

$$\frac{C}{Y} = \alpha \cdot \exp(\gamma \cdot \exp(\beta Ypc))$$

- Where α is the constant “maximum” saturation level. If there were no other variables in place, this is the level that a country will approach as long-term per capita income tends to infinity. γ is the parameter that defines the curvature of the Gompertz curve and β defines the sensitivity to income per capita.
- In the model we also allow different elasticities of the credit ratio to income per capita and to other explanatory variables in the long run versus the medium or the short run. We compute our Credit Gap as the difference between the observed level of the credit ratio and the estimated “structural” long-term level. Therefore, we extend the previous specification to include different sensitivities to income per capita:

$$\frac{C}{Y} = \exp[\alpha \cdot \exp(\gamma \cdot \exp(\beta_{LT} \overline{Ypc}_{it} + \beta_{MT} \widetilde{Ypc}_{it} + \beta_{ST} \widehat{Ypc}_{it}))]$$

- Where \overline{Ypc}_{it} represents the long-term (15 years) moving average of GDP per capita, \widetilde{Ypc}_{it} represents the medium-term deviation of income per capita with respect to its long-term level, i.e. $\widetilde{Ypc}_{it} = (\overline{Ypc}_{it}^{5yr} - \overline{Ypc}_{it}^{15yr})$, and \widehat{Ypc}_{it} represents the short-term deviation of the observed income per capita with respect to its medium-term (5-years) moving average, i.e. $\widehat{Ypc}_{it} = (Ypc_{it} - \overline{Ypc}_{it}^{5yr})$.
- We define the credit gap as the difference between the current Credit-to-GDP ratio and the “structural” part explained by long-term component of income per capita:

$$CreditGap_{i,t} = \frac{C}{Y} - [\exp[\alpha \cdot \exp(\gamma \cdot \exp(\beta_{LT} \overline{Ypc}_{it})) + \phi_{LT} \overline{X}_{it}^{15yr}]]$$

- The full description of the methodology can be found in <https://goo.gl/LTeTHD> and <https://goo.gl/r0Blbl>

Appendix

Methodology: Early Warning Systems

EWS Banking Crises:

The complete description of the methodology can be found at <https://goo.gl/r0BLbl> and at <https://goo.gl/VA8xXv>. A banking crisis is defined as systemic if two conditions are met: 1) Significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations), 2) Significant banking policy intervention measures in response to significant losses in the banking system. The probability of a crisis is estimated using a panel-logit model with annual data from 68 countries and from 1990 to 2012. The estimated model is then applied to quarterly data. The probability of a crisis is estimated as a function of the following leading indicators (with a 2-years lag):

- Credit-to-GDP Gap (Deviation from an estimated long-term level)
- Current account balance to GDP
- Short-term interest rate (deviation against US interest rate)
- Libor interest rate
- Credit-to-Deposits
- Regulatory Capital to Risk Weighted Assets ratio

EWS Currency Crises:

We estimate the probability of a currency crisis (a large fall in exchange rate and foreign reserves event) is estimated using a panel-logit model with 78 countries from 1980Q1 to 2015Q4, as a function of the following variables (with an 4-quarters lag):

- Credit-to-GDP ratio Gap (based on HP filter)
- Inflation
- BAA Spread
- Cyclical Current Account (based on HP filter)
- Short-term interest rate (deviation against US interest rate)
- Libor interest rate (different lags)
- Real effective exchange rate
- Investment to GDP
- GDP real growth rate (HP-trend and cyclical deviation from trend)
- Total trade to GDP

Appendix

Methodology: Early Warning Systems

EWS Banking Crises Definition of Regions:

- OPEC and Other Oil Exporters: Algeria, Angola, Azerbaijan, Bahrain, Canada, Ecuador, Nigeria, Norway, Qatar, Russia and Venezuela
- Emerging Asia: Bangladesh, China, India, Indonesia, Malaysia, Pakistan, Philippines, Thailand and Vietnam.
- South America & Mexico: Argentina, Brazil, Chile, Colombia, Mexico, Paraguay, Peru and Uruguay
- Other LatAm & Caribbean: Bolivia, Costa Rica, Dominican Rep., El Salvador, Guatemala, Honduras, Nicaragua and Panama
- Africa & MENA: Botswana, Egypt, Israel, Morocco, Namibia and South Africa.
- Emerging Europe: Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Rep, Slovenia, Turkey, Ukraine
- Core Europe: Austria, Belgium, Denmark, Finland, France, Germany, Netherlands, Sweden and United Kingdom.
- Periphery Europe: Greece, Ireland, Italy, Portugal and Spain
- Advanced Economies: Australia, Japan, Korea, Singapore, Iceland, New Zealand and Switzerland

EWS Currency Crises Definition of Regions:

- OPEC and Other Oil Exporters: Algeria, Angola, Azerbaijan, Bahrain, Nigeria, Norway, Oman, Qatar, Russia, Trinidad and Tobago, United Arab Emirates and Venezuela
- Emerging Asia: Bangladesh, China, Hong Kong, India, Indonesia, Malaysia, Pakistan, Philippines, Thailand and Vietnam.
- South America & Mexico: Argentina, Brazil, Chile, Colombia, Mexico, Paraguay, Peru and Uruguay
- Other LatAm & Caribbean: Bolivia, Costa Rica, Dominican Rep., El Salvador, Guatemala, Honduras, Jamaica and Nicaragua
- Emerging Europe: Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Rep, Slovenia, Turkey, Ukraine
- Africa & MENA: Botswana, Egypt, Israel, Morocco, Namibia, South Africa and Tunisia
- Advanced Economies: Australia, Japan, Korea, Singapore, Canada, Iceland, New Zealand and Switzerland

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