BBVA Research

Country Risk Report

A Quarterly Guide to Country Risks

December 2019

(Data as of November 30)

Creating Opportunities

Summary

Country Risk

Ratings agencies

- **Mostly positive cycle of updates from the rating agencies, with changes concentrated in Europe** (Greece, Ireland, Bulgaria and Czech Rep.), in line with our analysis that points to EU Periphery and EM Europe as the regions with a higher misalignment between rating agencies assessment versus markets and BBVA-Research, and thus, where agencies have more room to improve their ratings →

Financial Markets

- **The strong narrowing of sovereign CDS continues across the board. Median spread has reached yet a new minimum level since the Global Financial Crisis (GFC).** The reduction of sovereign spreads is generalized, with the only exception of Argentina →
- **The protracted tightening of sovereign spreads kept on reducing downgrade pressures and intensifying upgrade pressures across the board**, especially in EM Europe, EM Asia and EU Periphery →
- **Financial tensions (FT) have relaxed across different regions and across different markets and assets, with the only exception of Latam, due to the political unrest in Chile.** In US and Europe the relaxation was lead by a declined in interest rates and exchange rates volatility, partly due to a certain de-escalation of trade tensions and mildly better economic data →

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- **Sovereign CDS spreads continue widening their gap with respect to our estimated equilibrium spread level across the board.** The gap between markets' implicit ratings and those from agencies or BBVA Research have surged in the last months, especially in EU Periphery →
- From this Report on, we have revisited our Vulnerability Radar Analysis, changing some of the indicators and risk thresholds. **These changes suggest a somewhat better fiscal position of LatAm and EM Asia than in previous reports, although the external/liquidity position of the former now seems slightly worse** →
- **Private leverage continues growing in China, maintaining its large imbalance with respect to the estimated equilibrium level.** 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) →

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01

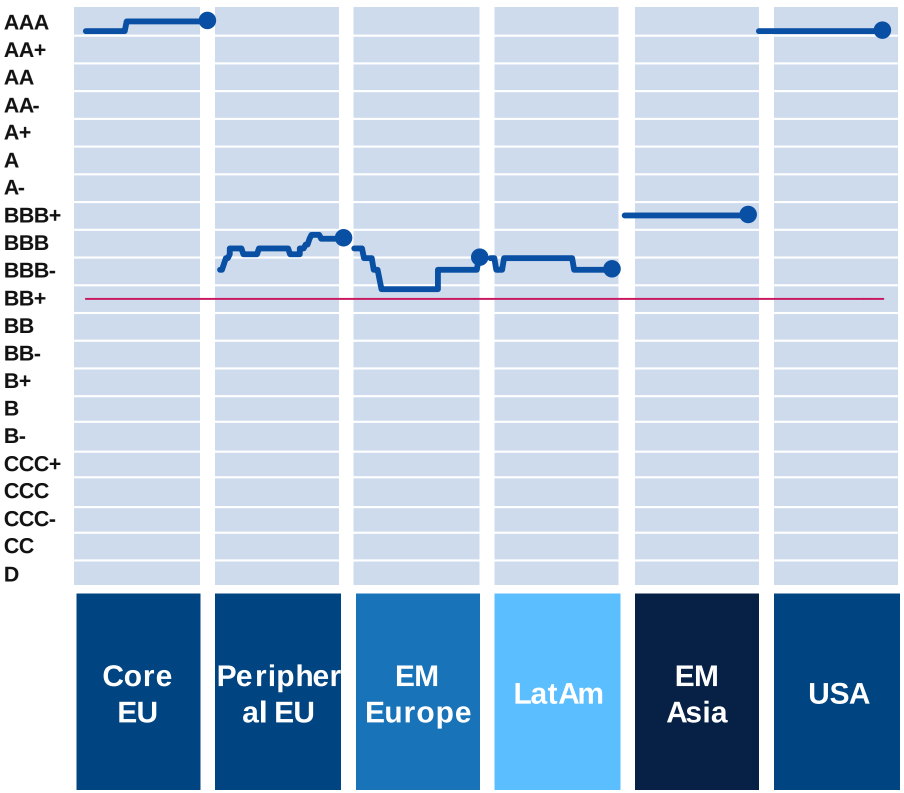
Sovereign Markets and Ratings Update

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

Sovereign markets and rating agencies update

Summary Index

SOVEREIGN RATING INDEX 2013-19

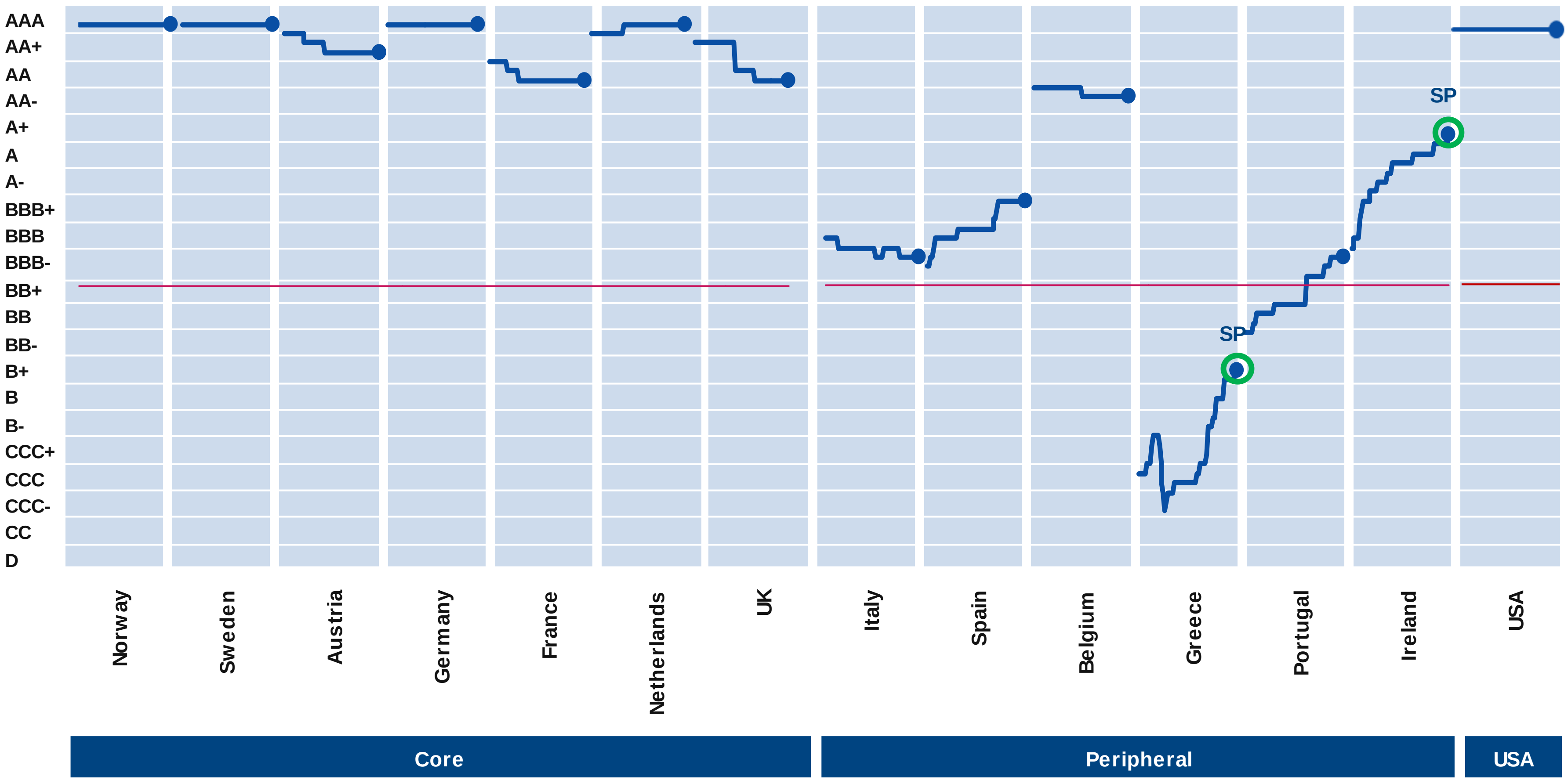


- **Mostly positive cycle of updates from the rating agencies, with changes concentrated in European countries (EU Periphery and EM Europe)**
- Bulgaria, Greece and Ireland were upgraded by S&P, while Czech Republic and Iceland by Moody's
- The EM Europe median rating improves

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

SOVEREIGN RATING INDEX 2013-19: DEVELOPED MARKETS



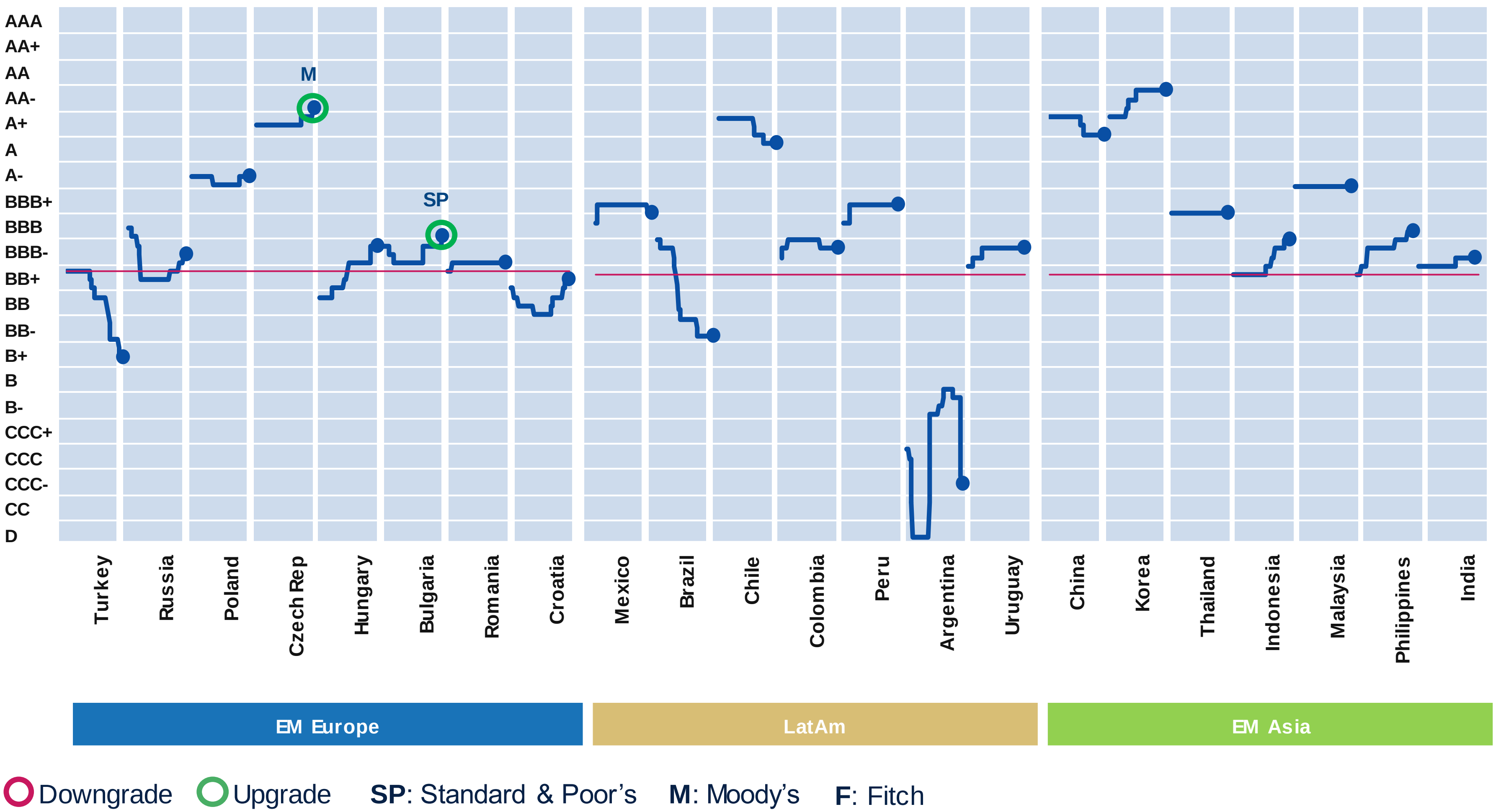
Downgrade Upgrade **SP**: Standard & Poor's **M**: Moody's **F**: Fitch

Source: BBVA Research

Sovereign markets and rating agencies update

Summary Index

SOVEREIGN RATING INDEX 2013-19: EMERGING MARKETS

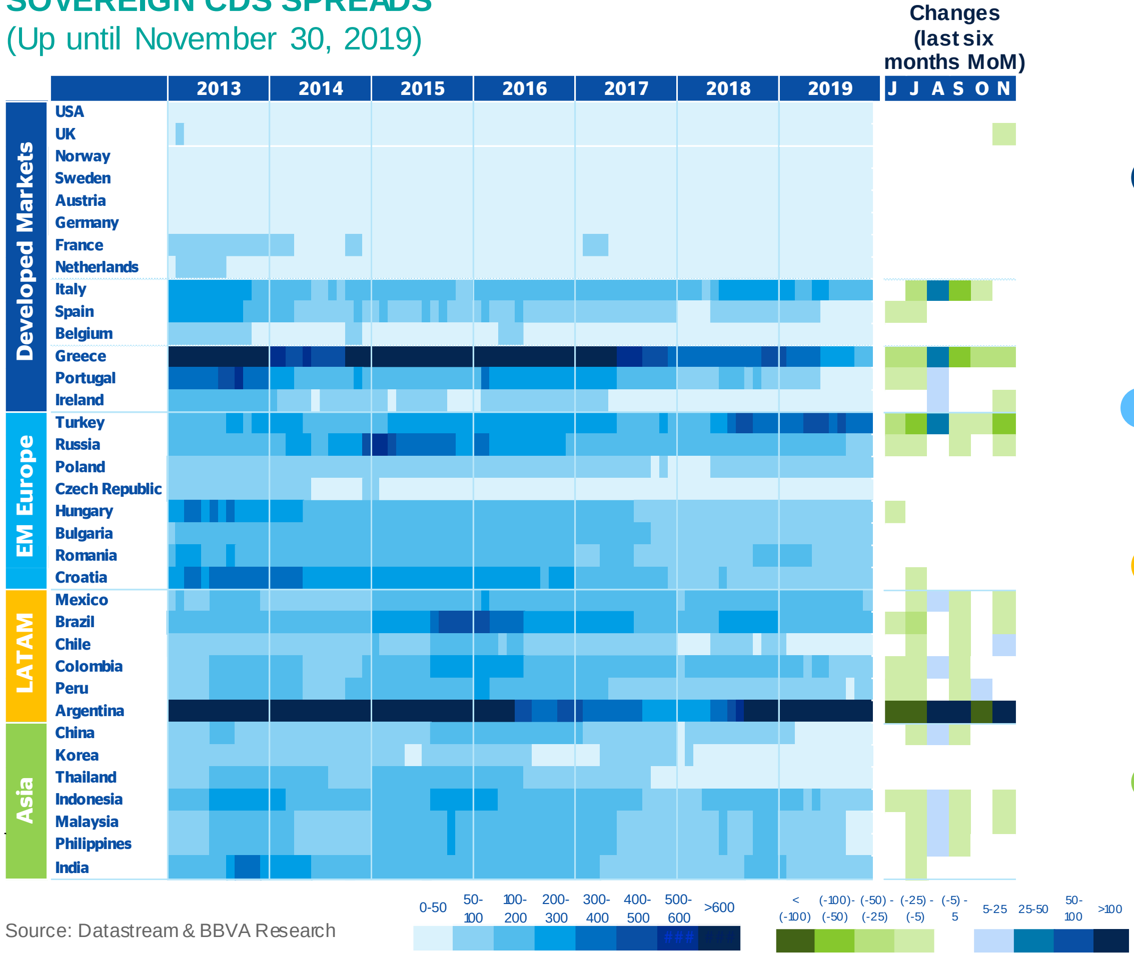


Source: BBVA Research

Sovereign markets and rating agencies update

Summary Index

SOVEREIGN CDS SPREADS
(Up until November 30, 2019)



Source: Datastream & BBVA Research

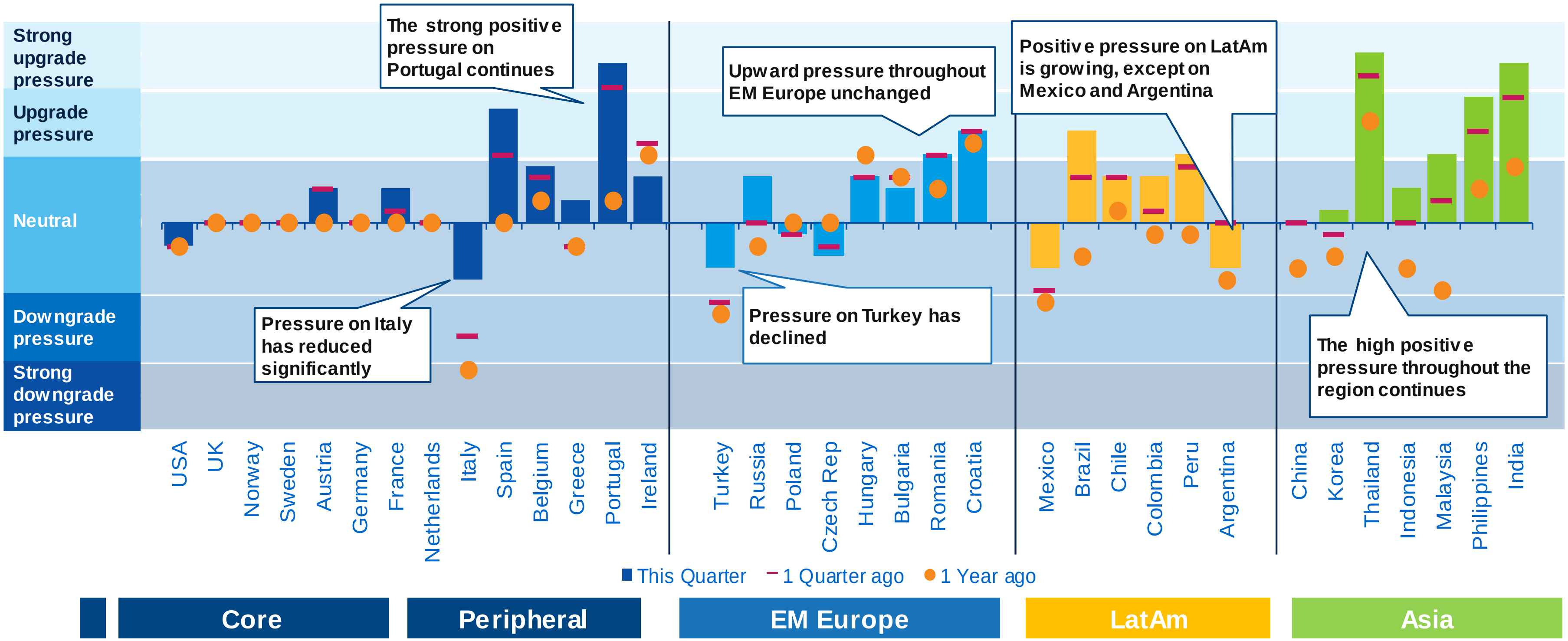
- EU Periphery CDS spreads kept reaching new minimum levels, most noticeable in the case of Portugal and Greece.
- Generalized reduction across EM Europe, with Turkey and Russia as the most benefited
- Argentina's spread continued surging to levels consistent with a sovereign default. The rest of the region is improving or stable
- Once again, CDS in EM Asia remained basically stable

The strong narrowing of sovereign spreads continues across the board. Median spread has reached yet a new minimum level after the GFC. The reduction of spreads is generalized, with the only exception of Argentina

Sovereign markets and rating agencies update

Summary Index

MARKETS VS. RATINGS PRESSURE GAP (LAST DATE: NOVEMBER 30, 2019)
(Difference between CDS-implied rating and actual sovereign rating, in notches, quarterly average)



Source: BBVA Research

The protracted tightening of sovereign spreads kept on reducing downgrade pressures and intensifying upgrade pressures across the board, especially in EM Europe, EM Asia and EU Periphery

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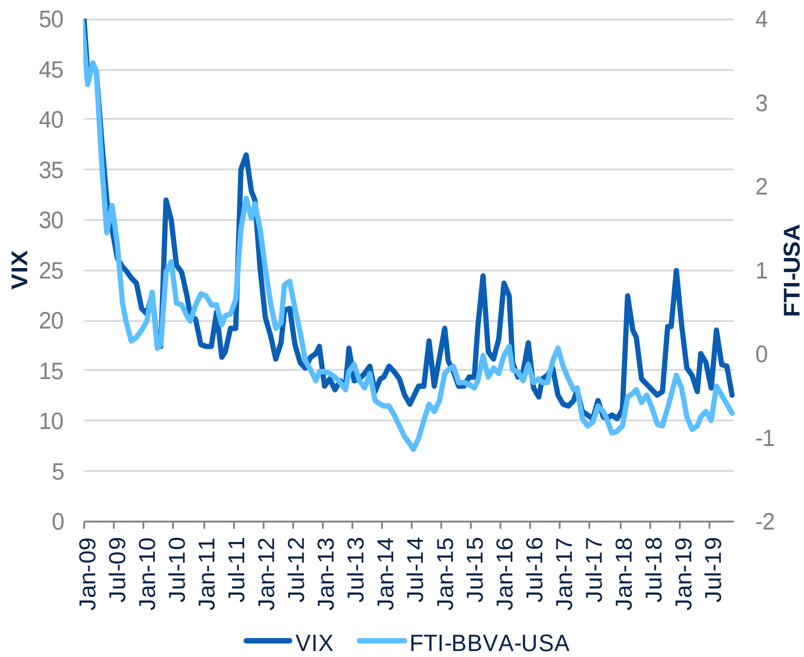
02

Financial Markets, Financial Tensions and Global Risk Aversion

Global Risk Aversion Evolution according to Different Measures
Financial Tensions Index
EMs FX Synchronization Indicator

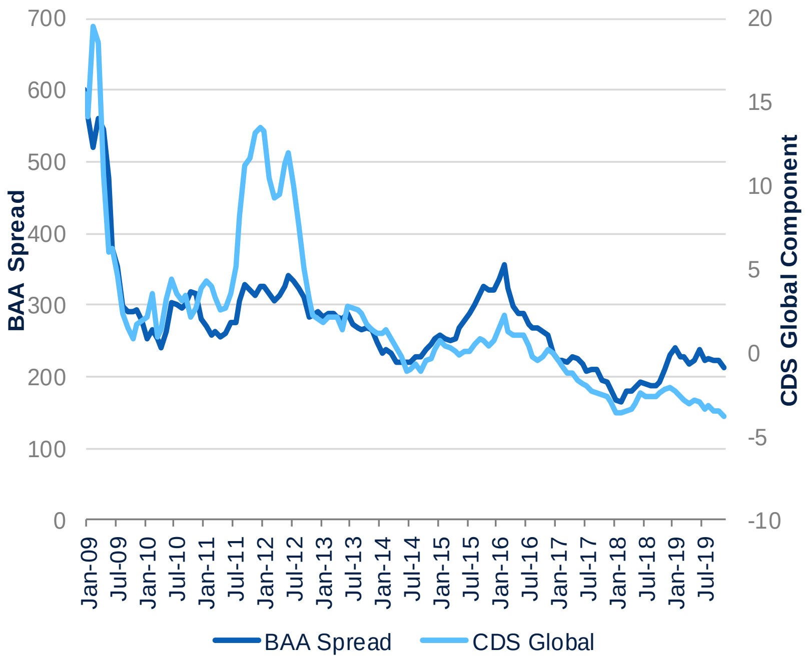
Financial Tensions and Global Risk Aversion (GRA)

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



Source: Bloomberg and BBVA Research

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

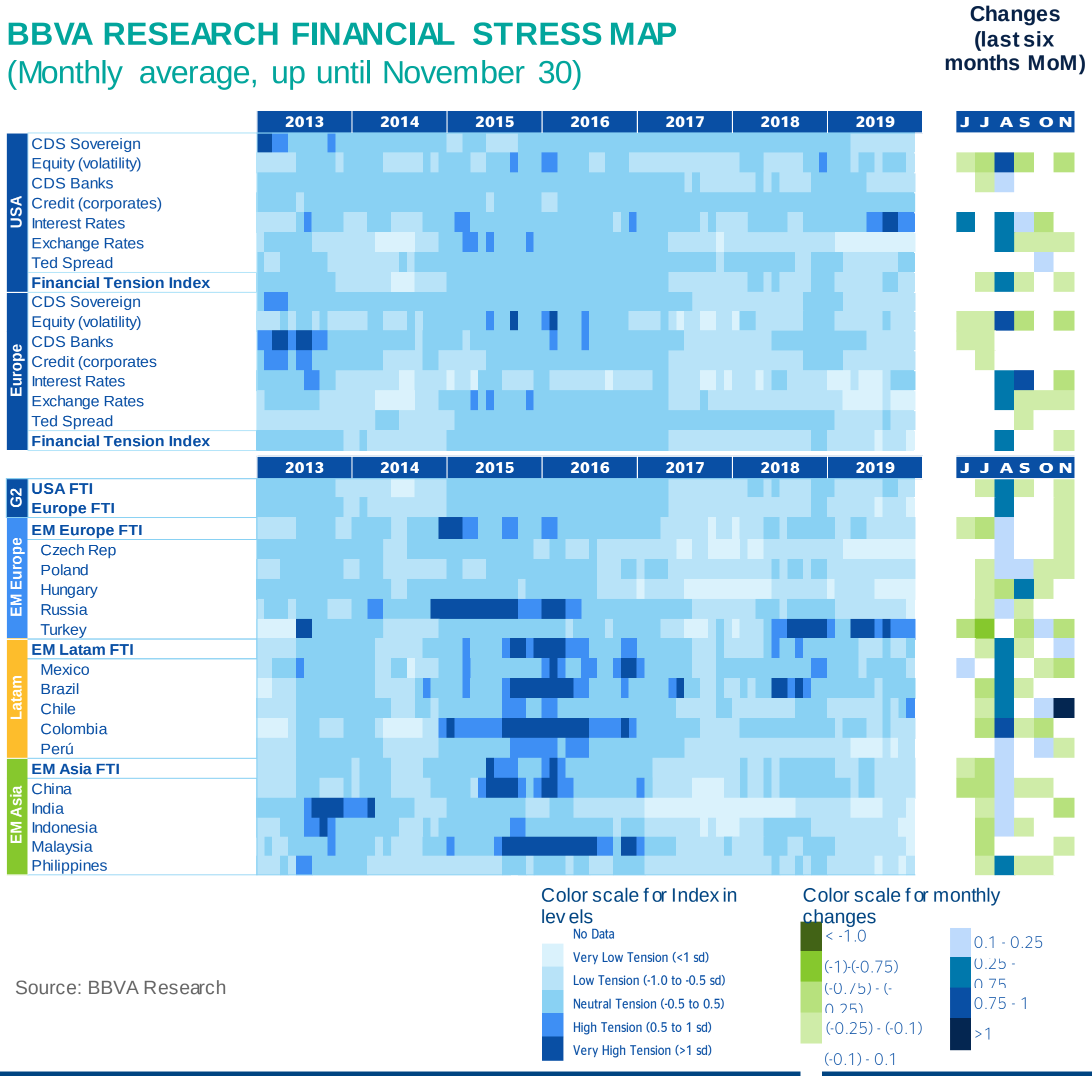
Global Risk Aversion indicators have relaxed during the most recent months. It is noticeable the recent decoupling of sovereign spreads (CDS) and BAA spread; the former continued declining while the latter has remained rather stable

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

Summary Index

BBVA RESEARCH FINANCIAL STRESS MAP

(Monthly average, up until November 30)



Source: BBVA Research

- Financial Tensions in US and Europe have relaxed lead by a declined in interest rates and exchange rates volatility, partly due to a certain de-escalation of trade tensions and mildly better economic data
- Generalized relaxation of financial tensions across EM Europe, including Turkey
- LatAm is the only region where FT have deteriorated recently, due to the political unrest in Chile and other countries
- Tensions in EM Asia continue to be low and declining

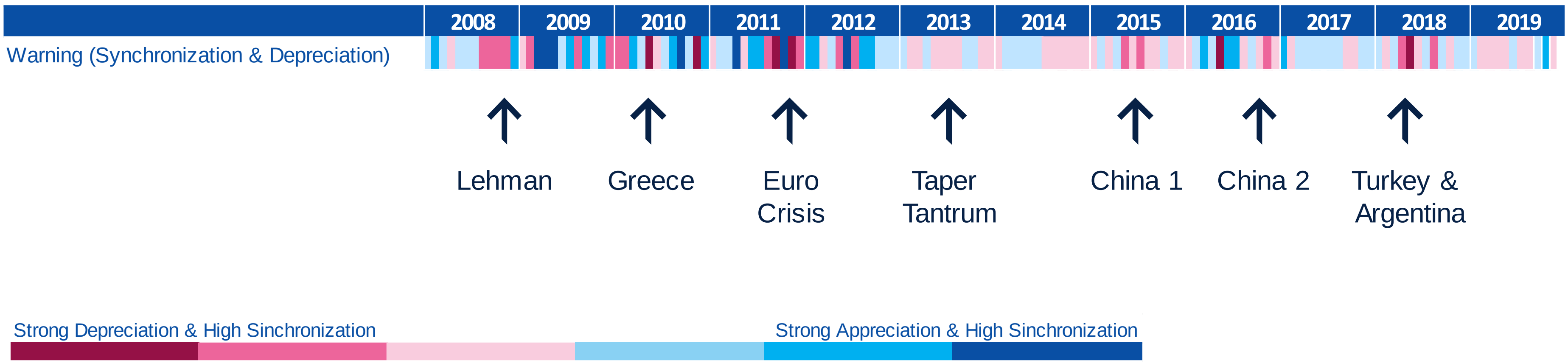
Financial stress has relaxed all across different regions and across different markets and assets, with the only exception of Latam, due to the political unrest in Chile

EMs FX Synchronization Indicator

Summary Index

SYNCHRONIZATION OF EMS FX CHANGES

Warning indicator based on Median EM FX changes and Synchronization Indicator



Source: BBVA Research

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.

In the most recent months a clear reduction in the synchronization of EM currencies has been observed. Additionally, most currencies have appreciated or remained stable

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03

Macroeconomic vulnerability and in-house regional country risk assessment

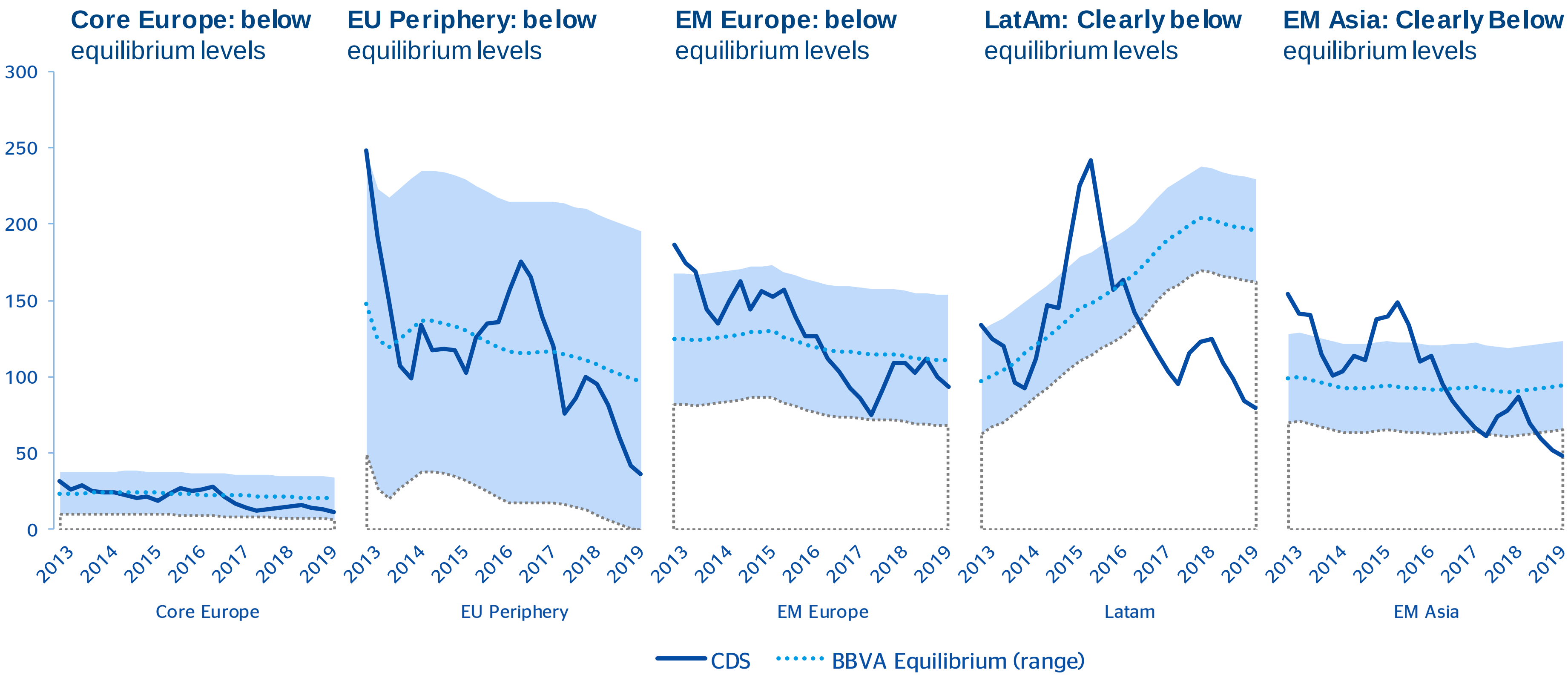
BBVA-Research sovereign ratings by regions
Equilibrium CDS by regions
Vulnerability Radars by regions

Creating Opportunities

Macroeconomic Vulnerability and Risk Assessment

Summary Index

CDS AND EQUILIBRIUM RISK PREMIUM: NOVEMBER 2019



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

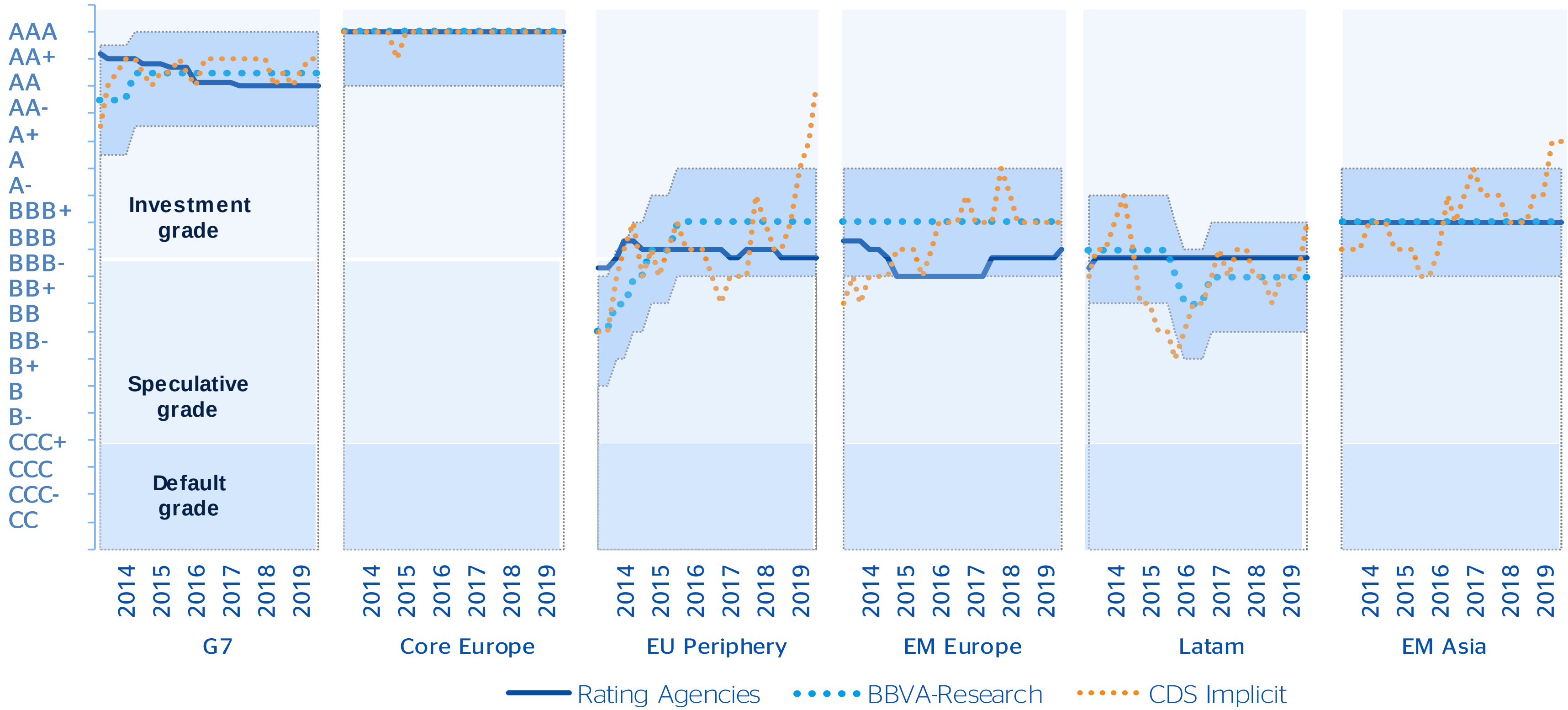
Sovereign CDS spreads continued widening their gap with respect to our estimated equilibrium level across all regions, with wider gaps in EU Periphery, Latam and EM Asia

Macroeconomic Vulnerability and Risk Assessment

Summary Index

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

Median rating improved in EM Europe. The gap between markets' implicit ratings and those from agencies or BBVA Research have surged in the last months, especially in EU Periphery

Macroeconomic Vulnerability and Risk Assessment

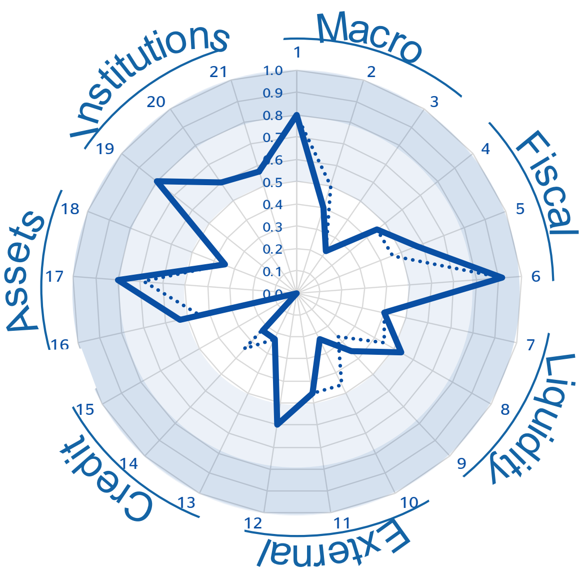
Summary Index

DEVELOPED MARKETS: VULNERABILITY RADAR 2019

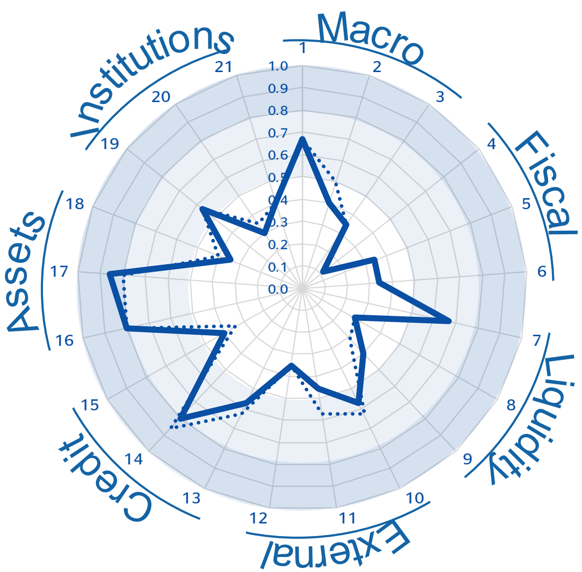
(Relative position for the developed countries. Risk equal to threshold=0,8, Min risk=0. Previous year data is shown as a dotted line)

*From this Report on, we include the Government Balance (%GDP) instead of the Cyclical Adjusted Balance. We have also reviewed several risk thresholds (see Appendix)

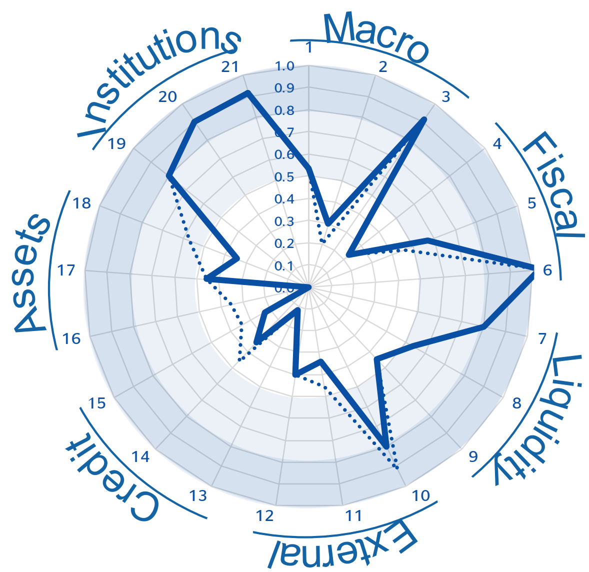
G7: High levels of public debt, weak economic growth, and high imbalances in housing prices continue to be the main vulnerabilities



Core Europe: Private and Corporate leverage, and high 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



High risk   Moderate Risk   Safe

Macro: (1) GDP (% YoY) (2) Prices (% YoY) (3) Unemployment (% LF).
Fiscal: (4) Government Balance (%GDP) (5) Interest rate – GDP %YoY (6) Public debt (% GDP).
Liquidity: (7) Debt by non-residents (%total) (8) Financial needs (%GDP) (9) Short-term External Debt (%).
External: (10) External debt (%GDP) (11) RER appreciation (% deviation) (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)

Macroeconomic Vulnerability and Risk Assessment

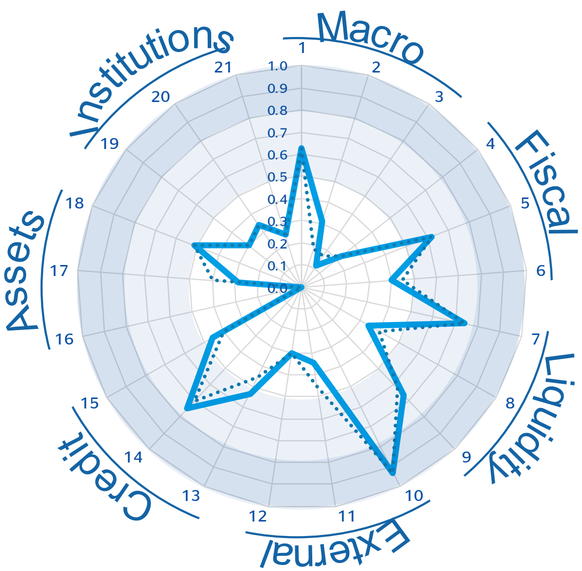
Summary Index

EMERGING MARKETS: VULNERABILITY RADAR 2019

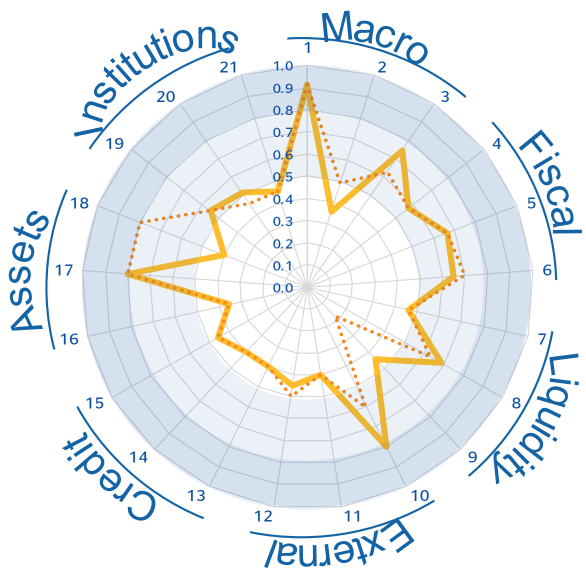
(Relative position for the emerging countries. Risk equal to threshold=0,8, Min risk=0. Previous year data is shown as a dotted line)

*From this Report on, we include the Government Balance (%GDP) instead of the Cyclical Adjusted Balance. Similarly, we include the ratio of Reserves to Reserves Adequacy Metric (ARA-IMF) instead of the appreciation of the REER. We have also reviewed several risk thresholds (see Appendix)

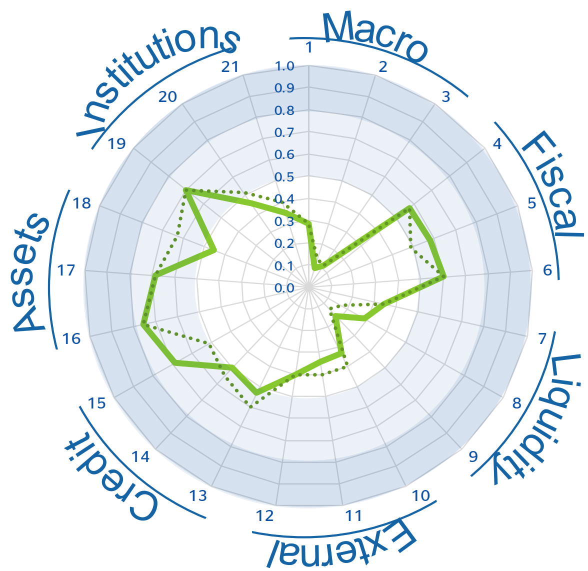
EM Europe: High vulnerabilities in external debt corporate debt. Other vulnerabilities are contained and remain unchanged



LatAm: Low growth and external debt levels stand out and continue to be the highest vulnerabilities. Housing prices vulnerability is also high



EM Asia: All vulnerabilities below their corresponding risk thresholds. Fiscal vulnerabilities worsening slightly



High risk Moderate Risk Safe

Macro: (1) GDP (% YoY) (2) Prices (% YoY) (3) Unemployment (% LF).
Fiscal: (4) Government balance (% GDP) (5) Interest rate – GDP %YoY (6) Public debt (% GDP).
Liquidity: (7) Debt by non-residents (%total) (8) Financial needs (%GDP) (9) Reserves to ST Ext. Debt (%)
External: (10) External debt (%GDP) (11) Reserves to ARA Metric (%) (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)

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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

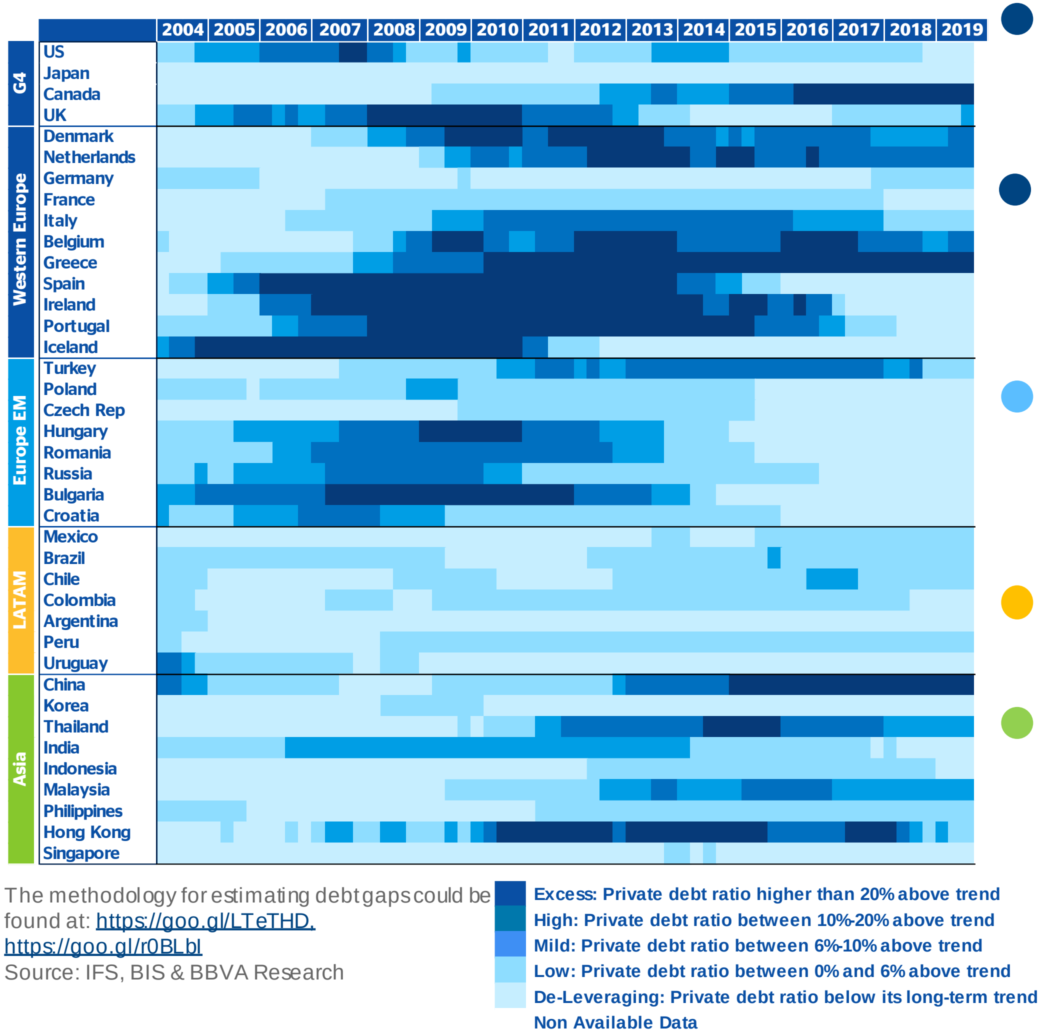
Assessment of financial and external disequilibria

Summary Index

Private leverage continues growing in China, maintaining its large imbalance with respect to the estimated equilibrium level. Highest gaps continue to be concentrated in some advanced economies (Canada, Belgium, Denmark, Netherlands).

PRIVATE DEBT GAPS COLOR MAP (2004-2019 Q3)

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



The methodology for estimating debt gaps could be found at: https://goo.gl/LTeTHD, https://goo.gl/r0BLbl

Source: IFS, BIS & BBVA Research

- Private leverage disequilibrium continues to be quite high in Canada, and its starting to grow in UK, 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, reducing its gap 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 continues growing in China**, 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

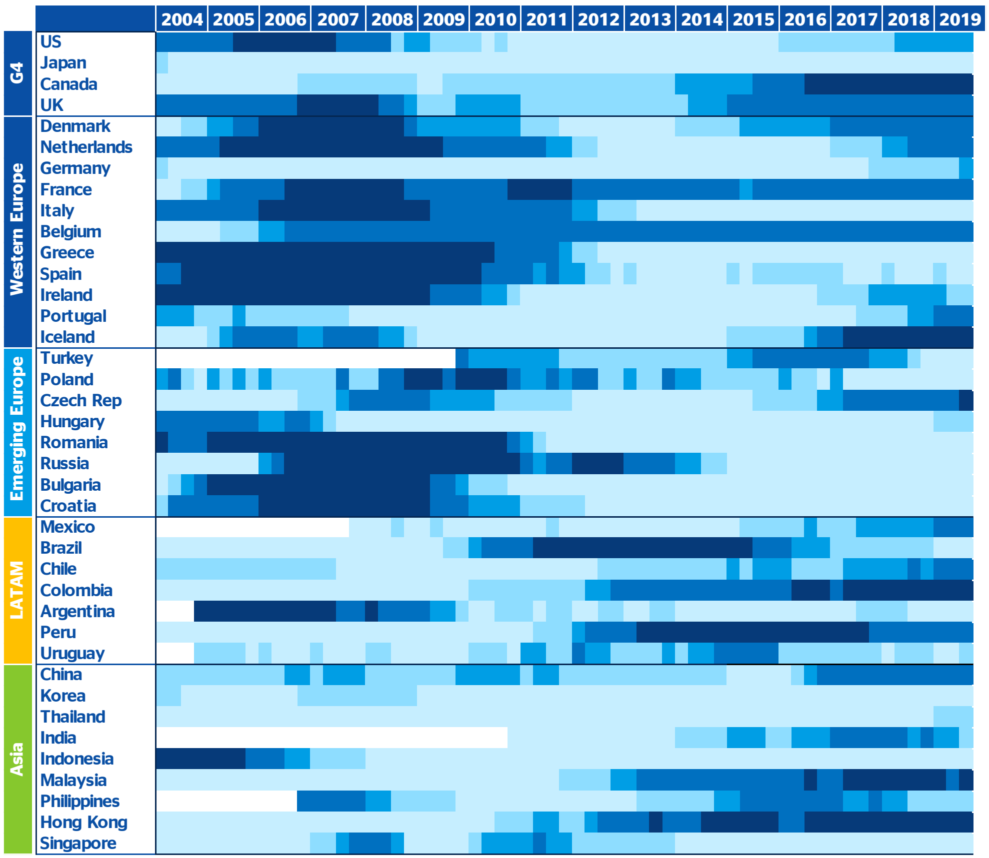
Assessment of financial and external disequilibria

Summary Index

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 is high in Colombia, HK and Malaysia, and worsening in Czech Rep.

REAL HOUSING PRICES GAPS COLOR MAP (2004-2019 Q3)

Gap between housing prices and its long-term structural trend



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

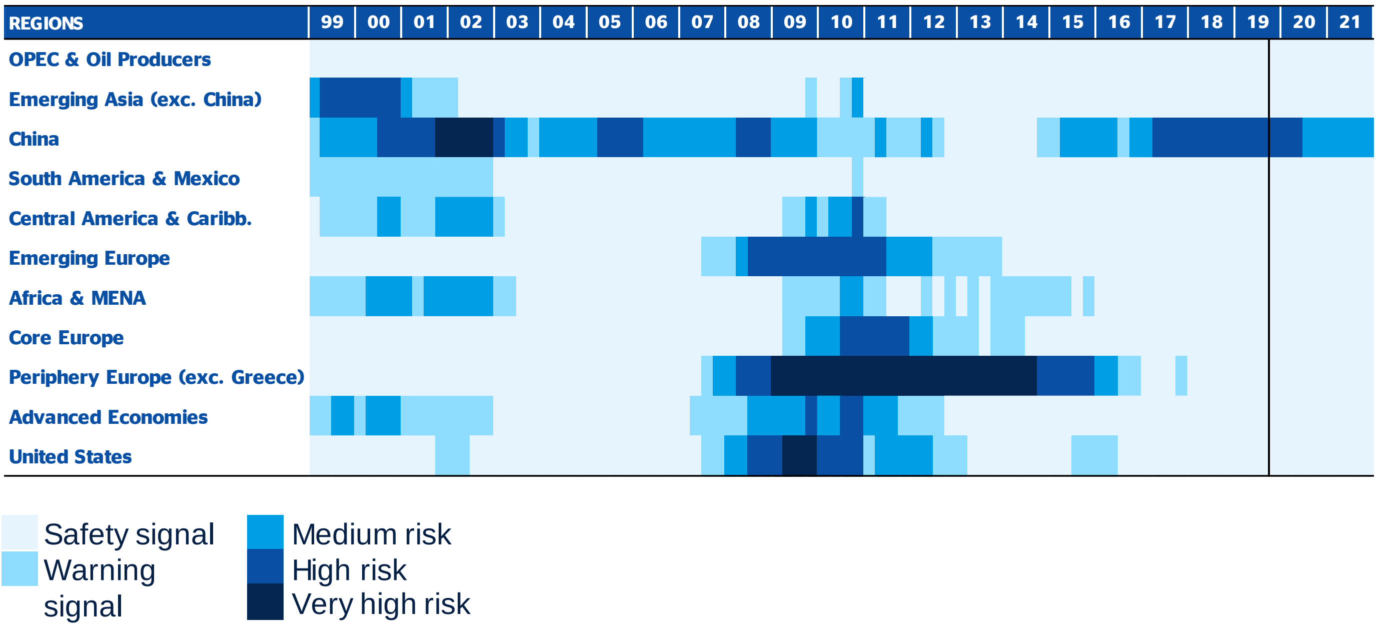
* https://goo.gl/xXj3Gm
Source: BBVA Research, BIS, Haver and Oxford Economics

- Housing prices gaps remain high in Canada and UK (the former coincides with a high credit-gap), and keep on growing in US
- The gap is also high in Belgium, 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 also in most of the region
- Prices gap 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

Assessment of financial and external disequilibria

Summary Index

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 is lower than in previous years, but it has remained constant according to the most recent data

- 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

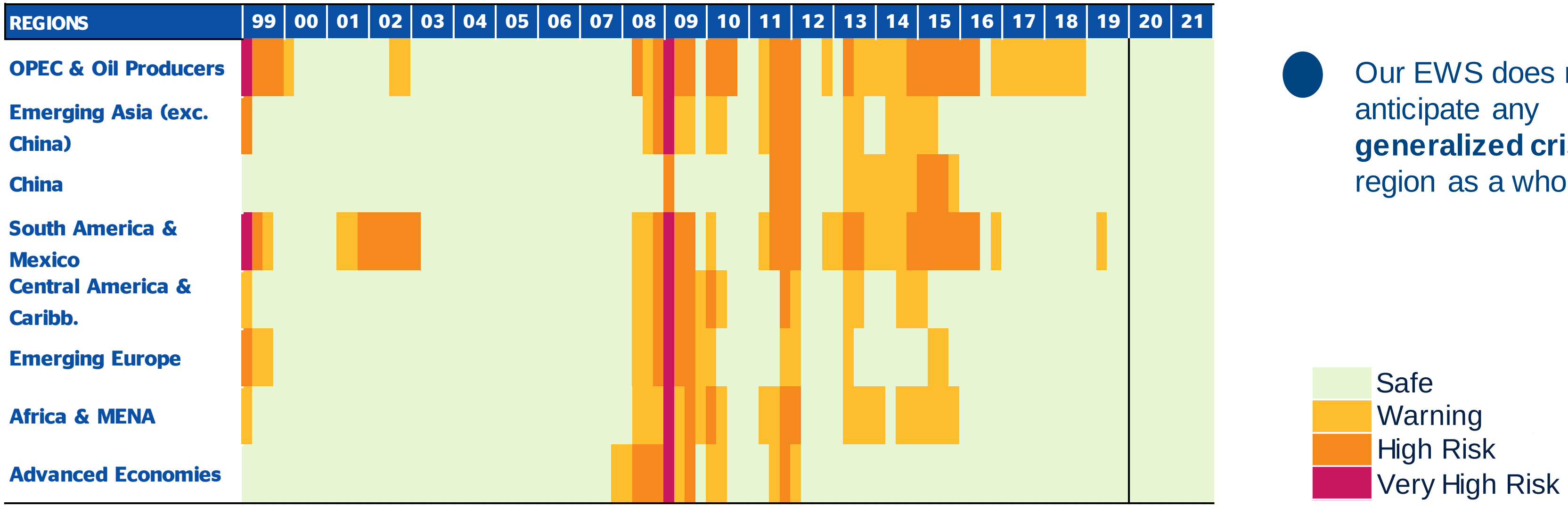
On average, no region is showing an aggregated excess in their banking sector that signals a high probability of a banking crisis. However, several countries within these regions, and China, continue to show a high vulnerability

Assessment of financial and external disequilibria

Summary Index

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 EWS does not anticipate any **generalized crisis** in any region as a whole

- 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

Exchange rate tensions have been contained during this quarter, with most EM currencies appreciating or showing low variations. Going forward, we do not expect any generalized surge of currency tensions in the coming months

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Vulnerability Indicators table by country

Creating Opportunities

Vulnerability Indicators Table

Summary Index

VULNERABILITY INDICATORS* 2019: DEVELOPED MARKETS

*From this Report on, we include the Government Balance (%GDP) instead of the Cyclical Adjusted Balance.

	Fiscal sustainability			External sustainability			Liquidity management			Macroeconomic performance			Credit and housing			Private debt			Institutional		
	Fiscal balance (1)	Interest rate GDP growth differential 2019-23	Gross public debt (1)	Current account balance (1)	External debt (1)	REER 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 gap (4)	Real housing prices gap (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	-5.6	-1.3	106.2	-2.5	95.4	1.3	26.1	16.9	30.7	2.5	1.7	3.7	-6.5	9.2	1.7	75.9	74.9	63.9	-0.5	-1.3	-1.5
Canada	-0.7	-0.3	87.5	-1.9	121.4	-0.4	9.6	10.4	22.3	1.5	2.2	5.8	29.0	25.6	3.6	100.5	111.1	128.6	-1.0	-1.9	-1.8
Japan	-3.0	-0.8	237.7	3.3	80.7	2.0	39.6	15.9	11.7	0.9	1.6	2.4	-13.1	-23.3	-9.8	58.2	102.4	48.5	-1.1	-1.4	-1.5
Australia	-0.7	-1.0	41.8	-0.3	112.3	-5.4	2.3	5.3	40.5	1.7	1.8	5.1	16.1	11.4	7.5	118.5	75.2	133.8	-1.0	-1.8	-1.7
Korea	0.7	-0.3	40.1	3.2	28.0	-3.8	1.2	7.8	12.9	2.0	0.7	4.0	-29.3	-6.4	-12.0	94.0	100.2	99.0	-0.5	-0.6	-1.2
Norway	7.6	-2.0	40.0	6.9	152.5	0.5	-8.7	0.2	47.3	1.9	1.9	3.6	16.9	21.6	-6.6	102.2	137.1	159.1	-1.2	-2.1	-2.0
Sweden	0.4	-2.6	36.9	2.9	166.1	-5.9	3.8	10.6	32.3	0.9	1.6	6.5	15.9	28.7	-0.9	88.0	157.2	183.8	-0.9	-2.1	-1.9
Denmark	0.2	-0.7	33.0	5.5	158.3	-0.5	3.8	15.2	30.0	1.7	1.2	5.0	21.1	12.6	5.7	112.9	109.8	298.7	-1.0	-2.1	-1.8
Finland	-0.7	-1.9	58.9	-0.7	158.3	0.3	6.4	11.1	67.1	1.2	1.1	6.5	22.5	6.0	-7.1	66.7	113.2	140.4	-0.9	-2.2	-2.0
UK	-1.4	-0.8	85.6	-3.5	299.1	-3.9	9.6	8.4	33.5	1.2	1.6	3.8	11.2	17.5	-1.4	85.9	82.0	58.6	0.0	-1.8	-1.6
Austria	0.1	-1.4	70.7	1.6	161.9	1.0	7.6	8.3	72.9	1.6	1.6	5.1	-9.6	22.7	-10.0	49.5	92.7	94.4	-0.9	-1.6	-1.9
France	-3.3	-1.4	99.3	-0.5	230.3	0.3	13.5	7.7	52.8	1.2	1.0	8.6	-0.5	13.4	3.4	60.3	142.9	107.9	-0.1	-1.3	-1.4
Germany	1.1	-2.1	58.6	7.0	142.4	0.8	3.6	8.7	49.3	0.5	1.8	3.2	3.9	7.9	1.5	54.4	58.1	88.7	-0.6	-1.9	-1.6
Netherlands	1.2	-2.1	49.2	9.8	514.5	1.6	4.9	15.7	43.7	1.8	2.1	3.3	16.6	13.8	5.6	99.5	164.2	101.3	-0.9	-2.0	-1.8
Belgium	-1.3	-0.9	101.0	-1.1	235.7	1.3	17.1	16.3	57.1	1.2	1.1	5.5	17.0	12.7	3.8	60.5	153.7	57.9	-0.4	-1.5	-1.4
Italy	-2.0	0.7	133.2	2.9	117.9	-0.4	23.0	15.2	29.4	0.0	0.7	10.3	7.0	-9.4	6.7	41.1	69.3	84.8	-0.3	-0.2	-0.2
Spain	-2.2	-0.9	85.2	0.9	169.0	0.2	16.6	15.1	49.5	2.3	0.8	13.4	-21.1	-1.3	-1.5	59.8	90.6	91.4	-0.3	-0.6	-1.0
Ireland	0.0	-2.7	60.9	10.8	773.0	-1.0	7.2	11.1	63.2	4.3	1.4	5.5	-29.5	4.3	-4.3	41.3	188.2	46.4	-1.0	-1.5	-1.5
Portugal	-0.2	-0.6	117.6	-0.6	202.6	-0.6	14.0	10.6	54.3	1.9	4.3	6.1	-6.4	17.5	1.5	65.5	97.3	98.9	-1.1	-0.8	-1.1
Greece	-0.3	-1.8	176.6	-3.0	221.6	-0.8	14.5	8.3	81.5	2.0	0.9	17.8	27.8	-3.8	25.6	54.6	57.9	107.7	-0.1	0.1	-0.2

*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

Summary Index

VULNERABILITY INDICATORS* 2019: EMERGING MARKETS

*From this Report on, we include the Government Balance (%GDP) instead of the Cyclical Adjusted Balance. Similarly, we include the ratio of Reserves to Reserves Adequacy Metric (ARA Metric-IMF) instead of the appreciation of the REER.
**Additionally, we now include the ratio of Reserves to Imports as part of the Liquidity indicators

	Fiscal sustainability			External sustainability			Liquidity management				Macroeconomic performance			Credit and housing		Private debt			Institutional		
	Fiscal balance (1)	Interest rate GDP growth differential 2019-23	Gross public debt (1)	Current account balance (1)	External debt (1)	Reserves to ARA Metric	Gross financial needs (1)	Reserves to short-term external debt (3)	Reserves to Imports	Debt held by non-residents (3)	GDP growth (4)	Consumer prices (4)	Unemployment rate (5)	Private credit to Gap (4)	Real housing prices Gap (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	0.6	0.4	19.2	3.2	65.2	1.7	3.5	1.8	7.5	44.4	3.7	2.5	4.9	-27.4	-10.4	22.3	70.4	72.3	-0.4	0.2	0.0
Czech Rep	0.2	-2.4	31.6	-0.1	77.2	5.4	4.1	1.3	10.3	39.1	2.5	2.3	2.2	-4.0	20.7	32.3	56.0	80.7	-1.0	-0.5	-1.0
Croatia	0.0	-1.2	71.1	1.7	86.1	1.3	9.6	1.9	9.3	34.5	3.0	1.2	9.0	-9.2	-5.2	33.1	25.3	86.8	-0.8	-0.1	-0.3
Hungary	-1.8	-2.8	67.5	-0.9	104.0	1.1	15.5	1.1	2.7	36.7	4.6	3.2	3.5	-18.0	4.5	17.3	78.9	87.1	-0.8	-0.1	-0.6
Poland	-1.5	-2.5	47.8	-0.9	65.6	1.2	7.2	1.6	4.9	45.4	4.0	3.3	3.8	-7.7	-6.9	34.6	85.7	105.2	-0.5	-0.6	-0.4
Romania	-3.7	-2.5	37.4	-5.5	50.6	1.3	7.8	1.4	4.4	45.3	4.0	4.5	4.3	-17.8	-16.0	15.7	32.2	79.2	-0.1	0.1	-0.3
Russia	1.0	0.8	16.5	5.7	25.5	3.2	-0.3	5.6	14.7	18.2	1.1	3.8	4.6	-13.7	-33.8	18.8	44.7	108.5	0.5	0.8	0.8
Turkey	-4.6	-2.6	30.1	-0.6	51.7	0.7	8.0	0.6	4.2	40.6	0.1	15.9	13.8	1.9	-7.8	13.7	65.7	107.3	1.3	0.3	0.3
Argentina	-4.0	-20.5	93.3	-1.2	77.6	0.9	16.0	0.6	7.2	38.8	-2.5	53.6	10.9	-2.4	-10.0	5.5	16.5	81.2	0.0	0.1	0.2
Brazil	-7.5	1.9	91.6	-1.2	38.5	1.6	15.1	3.3	16.6	10.7	0.9	3.6	11.8	3.0	-1.0	28.9	43.7	88.8	0.4	0.4	0.3
Chile	-2.2	-2.1	27.5	-3.5	72.0	0.9	2.5	1.6	5.8	30.2	2.5	2.6	6.9	6.8	11.7	46.0	100.1	161.8	-0.4	-1.0	-1.1
Colombia	-1.7	-0.4	51.0	-4.2	40.1	1.3	4.9	2.9	9.2	29.3	3.0	3.5	11.0	-2.9	23.5	27.8	35.2	123.1	0.8	0.3	0.4
Mexico	-2.8	2.3	53.8	-1.2	36.2	1.2	10.3	2.6	4.2	30.1	0.7	3.7	3.2	1.9	13.9	16.3	24.9	90.6	0.6	0.9	0.7
Peru	-1.5	-0.3	26.9	-1.9	28.8	2.4	3.5	7.3	16.1	27.2	2.5	2.2	6.2	3.5	16.4	17.0	36.6	117.4	0.3	0.5	0.5
China	-6.1	-5.2	75.6	1.0	14.2	0.9	4.4	3.4	15.4	..	6.1	2.2	3.8	31.0	16.0	54.8	158.4	204.7	0.3	0.3	0.2
India	-7.5	-3.1	69.0	-2.0	20.8	1.4	10.3	3.6	7.9	5.7	6.1	3.9	5.6	-1.0	5.9	11.4	40.7	80.2	1.0	0.2	0.0
Indonesia	-1.9	-2.5	30.3	-2.9	38.7	0.8	4.3	2.2	7.2	59.5	5.0	3.4	5.2	-0.7	-25.9	16.9	22.8	102.9	0.5	0.3	0.3
Malaysia	-3.0	-2.0	56.3	3.1	60.1	1.2	10.0	1.1	5.8	21.7	4.5	1.9	3.4	10.4	21.1	89.7	68.8	115.4	-0.2	-0.3	-0.6
Philippines	-1.1	-3.3	39.3	-2.0	20.7	1.8	7.0	4.7	6.1	25.9	5.7	1.6	5.2	8.1	4.1	4.3	42.0	73.1	1.1	0.5	0.5
Thailand	-0.2	-2.0	42.4	6.0	31.6	2.0	5.6	3.4	9.1	14.7	2.9	1.3	1.2	13.5	2.1	69.9	45.6	101.0	0.7	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. ARA Metric: see https://www.imf.org/external/np/pp/eng/2011/021411b.pdf
Source: BBVA Research, Haver, BIS, IMF and World Bank

Methodological Appendix

Creating Opportunities

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

*From this Report on, we include the Government Balance (%GDP) instead of the Cyclical Adjusted Balance. Similarly, we include the ratio of Reserves to ARA Metric (IMF) instead of the appreciation of the REER. *(ARA Metric = 10% × Exports + 10% × Broad Money + 30% × Short-term Debt + 20% × Other Liabilities)*

**Additionally, we now include the ratio of Reserves to Imports as part of the Liquidity indicators

***We have also revised the thresholds for several variables, incorporating new estimations from the IMF Public Debt Sustaina bility Analysis (DSA) and from an analysis of historical data

Vulnerability Dimensions	Risk Thresholds Developed Economies	Risk Thresholds Emerging Economies	Risk Direction	Source
Macroeconomics				
GDP	1.0	3.0	Lower	BBVA Research (based on historical percentiles)
Inflation	4.0	10.0	Higher	BBVA Research (based on historical percentiles)
Unemployment	10.0	10.0	Higher	BBVA Research (based on historical percentiles)
Fiscal Vulnerability				
Government fiscal balance (% GDP)	-4.0	-4.0	Lower	Baldacci et Al (2011). Assesing Fiscal Stress. IMF WP 11/100
Expected Interest rate GDP growth diferential 5 years ahead	0.8	0.0	Higher	Baldacci et Al (2011). Assesing Fiscal Stress. IMF WP 11/100
Gross Public Debt (%GDP)	85.0	70.0	Higher	IMF Public Debt Sustainability Analysis (DSA) in Market-Acess Countries, 2013
External Vulnerability				
Current Account Balance (% GDP)	-5.0	-3.0	Lower	BBVA Research (based on historical percentiles)
External Debt (% GDP)	200.0	60.0	Higher	BBVA Research (based on historical percentiles)
Real Exchange Rate (Deviation from 4 yr average) (Developed)	5.0		Higher	EU Commission (2012) and BBVA Research (based on historical percentiles)
Reserves to ARA Metric (Emerging)		0.8	Lower	Baldacci et Al (2011). Assesing Fiscal Stress. IMF WP 11/100
Liquidity Problems				
Gross Financial Needs	25.0	15.0	Higher	IMF Public Debt Sustainability Analysis (DSA) in Market-Acess Countries, 2013
Debt Held by Non Residents	55.0	45.0	Higher	IMF Public Debt Sustainability Analysis (DSA) in Market-Acess Countries, 2013
Short Term Debt Pressure				
Public Short-Term Debt as % of Total Public Debt (Developed)	15.0		Higher	Baldacci et Al (2011). Assesing Fiscal Stress. IMF WP 11/100
Reserves to Imports (Emerging)		3.0	Lower	BBVA Research (based on historical percentiles)
Reserves to Short-Term Ext. Debt (Emerging)		0,6	Lower	Baldacci et Al (2011). Assesing Fiscal Stress. IMF WP 11/100
Private Balance Sheets				
Household Debt (% GDP)	84.0	54.0	Higher	BBVA Research (based on historical percentiles)
Non Financial Corporate Debt (% GDP)	120.0	80.0	Higher	BBVA Research (based on historical percentiles)
Financial liquidity (Credit/Deposits)	130.0	110.0	Higher	EU Commission (2012) and BBVA Research
Excess Credit and Assets				
Private Credit to GDP (annual Change)	12.0	12.0	Higher	BBVA Research
Real Housing Prices growth (% yoy)	12.0	12.0	Higher	BBVA Research
Equity growth (% yoy)	20.0	20.0	Higher	IMF Global Financial Stability Report
Institutions				
Political Stability	1 (9th percentil)	-0.6 (8th percentil)	Lower	World Bank Governance Indicators
Control of Corruption	1 (9th percentil)	-0.6 (8th percentil)	Lower	World Bank Governance Indicators
Rule of Law	1 (8th percentil)	-1 (8 th percentil)	Lower	World Bank Governance Indicators

Appendix

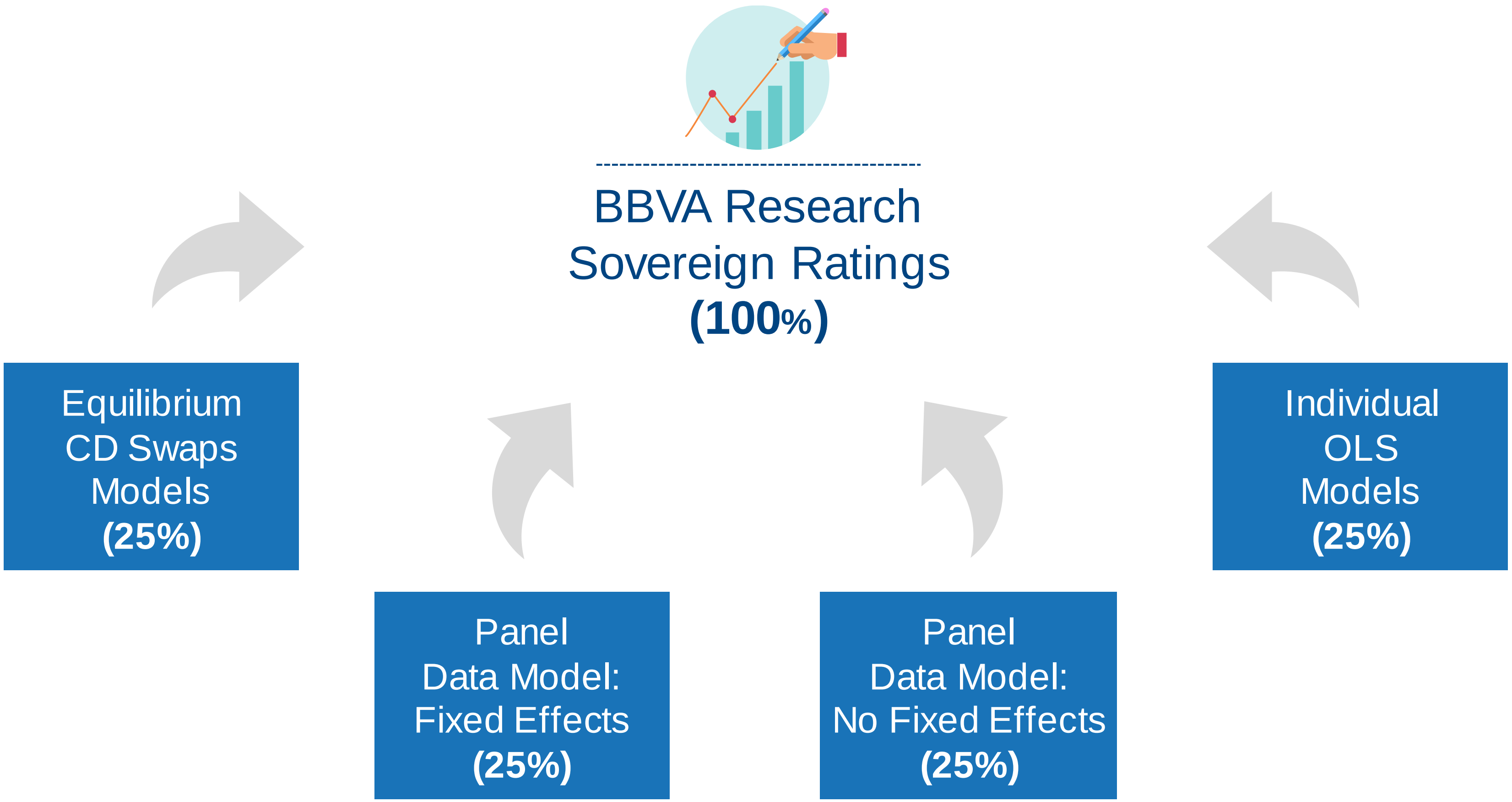
Methodology: models and BBVA country risk

- **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



Source: BBVA Research

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 Janury-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 (R2) within a rolling period including the latest 15 days. We assume that the highest the R2 the higher the Synchronization or comovement of the 23 FX rates. This moving- R2 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 daly 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:

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

- 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:

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

- 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:

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

- The full description of the methodology can be found in https://goo.gl/LTeTHD and https://goo.gl/r0BLbI

Appendix

Methodology: Early Warning Systems

EWS Banking Crises:

The complete description of the methodology can be found at https://goo.gl/r0BLbI 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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