CitiFX®

Early Warning Signal

30 June 2011 Update

CitiFX Hedging Tool for Emerging Markets

Bloomberg: CIGV

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Market Commentary

Summary

- Emerging market risk continued to rise in June, although increases in our EWS scores were on average smaller than in the previous month. The overall EM risk index (Bloomberg: CEWSEM Index, Reuters: .CEWSEM) rose from 42.75% to 44.16%, the highest reading since January 2011.
- Countries that already had above-average risk scores in May saw consistent further increases in June, with **Turkey** maintaining its position as the riskiest economy. The rise in Turkey's EWS index was driven by a broad combination of a further deterioration in external balances, slower than expected industrial production and export growth, wider CDS spread, higher FX volatility and increased banking sector leverage.
- Lower growth and worse external balances also lifted the risk indices for **Romania** and **South Africa**, which joined Turkey at the top of the risk scale. In case of Romania, the increase in risk was further aggravated by an accelerating speed of real exchange rate appreciation. Strong REERs also supported the risk indices of **Poland**, **Hungary**, **Czech Republic**, **Brazil** and **Mexico**.
- Despite the appreciation of the REER, Mexico's risk index nevertheless declined on the back of re-acceleration in May export growth and lower rate of money supply expansion. In addition, the risk indices for **Singapore**, **Israel**, **Russia**, **Philippines** and **Argentina** also declined. **China** maintained its position as the economy with the lowest currency risk.
- Due to high and rising risk indices, the EWS continues to issue hedge signals for long **TRY**, **RON**, **ZAR**, **COP**, **PLN** and **BRL** exposures (reduced hedge signals for short exposures). The model also issues new signals for the **HUF** and **KRW**, where lower external balances and exports led to increased risk.
- On the other hand, the above-average risk score for **Mexico** declined, pointing to no need to further deviate from the hedge benchmark.

EWS Heat Map

Above average risk

Below average risk

June 2011	Index*	MoM	Hedge signal** Long EM	Hedge signal** Short EM	External financing	Money supply	Industrial prod.	Exports	Loan-to-deposit	Short-term debt	Implied FX vol	CDS spread	Equities	Eco surprises	Global risk	REER
Turkey	62.9%	7.9% ▲	ATMF	25D												
Romania	58.8%	6.2% ▲	ATMF	25D												
South Africa	57.6%	5.3% ▲	ATMF	25D												
Colombia	56.6%	3.5% ▲	ATMF	25D												
Poland	55.5%	1.4% ▲	ATMF	25D												
Brazil	55.4%	2.3% ▲	ATMF	25D												
Hungary	55.2%	5.9% ▲	ATMF	25D												
Korea	54.1%	7.9% ▲	25D	ATMF												
Mexico	51.1%	-0.3% ▼	-	Fwd												
Singapore	49.5%	-1.7% ▼	-	Fwd												
Israel	48.9%	-1.3% ▼	-	Fwd												
India	47.5%	1.7% ▲	-	Fwd												
Czech Republic	45.8%	2.1% ▲	-	Fwd												
Thailand	45.3%	0.2% ▲	-	Fwd												
Malaysia	44.0%	3.9% ▲	-	Fwd												
Chile	43.8%	0.0% ▲	-	Fwd												
Russia	43.4%	-0.8% ▼	-	Fwd												
Philippines	43.2%	-1.8% ▼	-	Fwd												
Indonesia	41.6%	0.7% ▲	-	Fwd												
Argentina	40.0%	-5.0% ▼	-	Fwd												
Taiwan	37.0%	6.2% ▲	-	Fwd												
China	28.2%	-1.5% ▼	-	Fwd												

Risk index is below 50%
Risk index is between 50-55%
Risk index is between 55-65%
Risk index is above 65%

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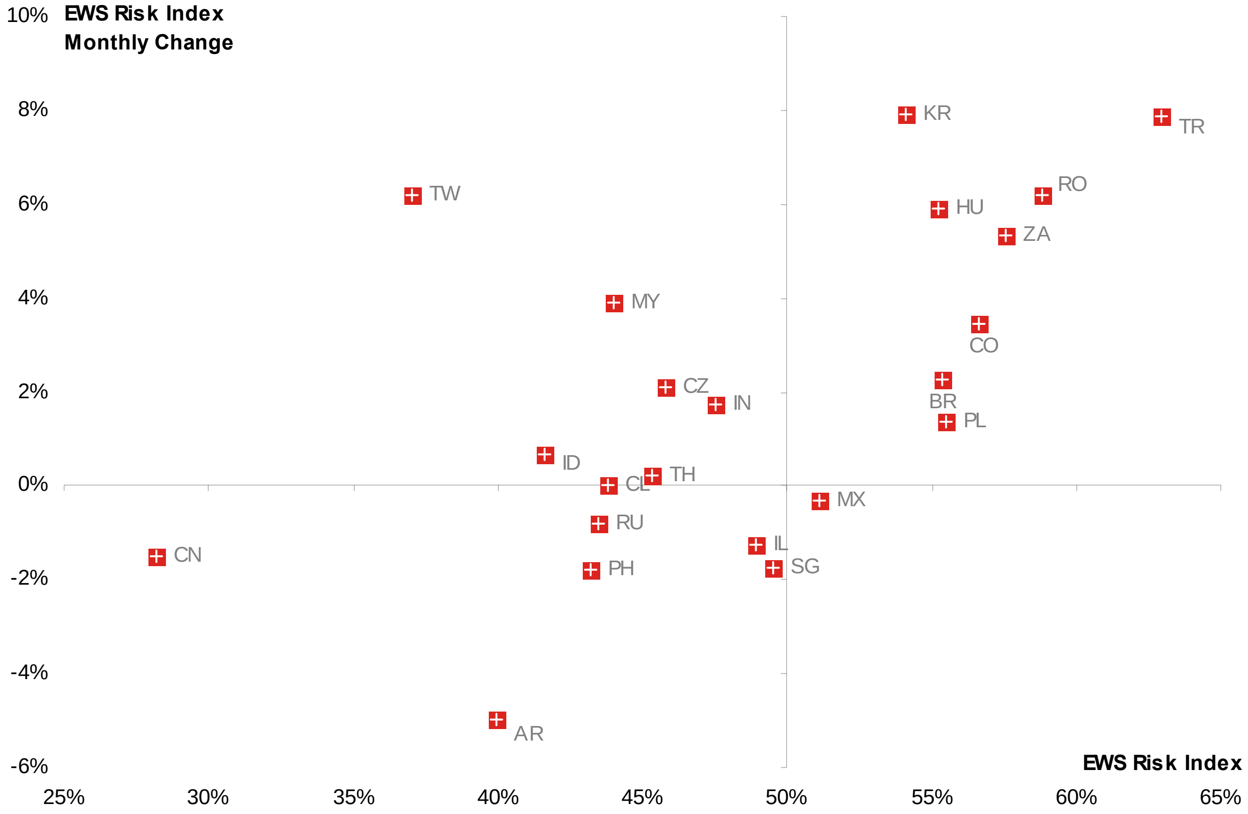
* - The EWS risk indices are calculated as average rolling percent ranks of 12 indicators of economic and financial stress. The indices vary between 0% (low risk) and 100% (high risk). For more information, see slides 7-9.

** - Hedge signals are triggered for above average and rising risk indices. For investors with long emerging market currency exposures the delta of the hedge signal increases with the level of the risk index. For investors with short emerging market currency exposures, the delta of the hedge signals falls with the level of the risk index. For more information, see slides 5.

EWS Risk Index Changes and Levels

Low but rising risk indices.
No hedge required, but watch for signs of increased risk.

High and rising risk indices.
Consider hedging these currencies.



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Low and falling risk indices.
No hedge is required. These currencies are 'safest'.

High but falling risk indices.
Risk is receding. No hedge required, but watch for signs of increased risk.

EWS hedge rule for EM exposures

- Above average and rising risk indices are negative for EM currencies and justify putting on hedges for long EM exposures. Similarly, high and rising risk indices can be used as signals to reduce hedges on short EM exposures.
- The inception deltas of hedges are tied to level of EM risk:

Hedge signal for long EM exposure	EWS Risk Index	Hedge signal for short EM exposure
	If Risk Index is unchanged or lower than in previous month	
No Hedge	Any Risk Index Level	Long EM via Forward
	If Risk Index is higher than in previous month	
No Hedge	Risk index is below 50%*	Long EM via Forward
25 Delta Put on EM	Risk index is between 50-55%*	ATMF Call on EM
ATMF Put on EM	Risk index is between 55-65%*	25 Delta Call on EM
Short EM via Forward	Risk index is above 65%*	No Hedge

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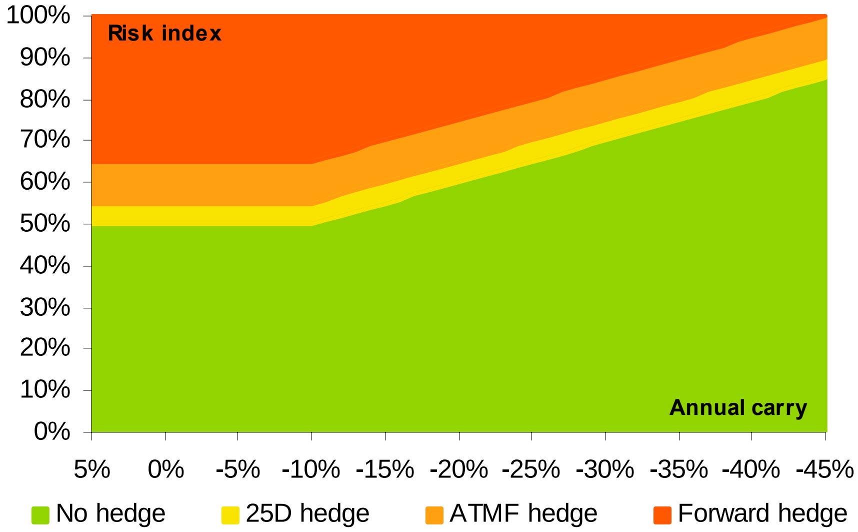
EWS hedge decision rule for long EM exposures



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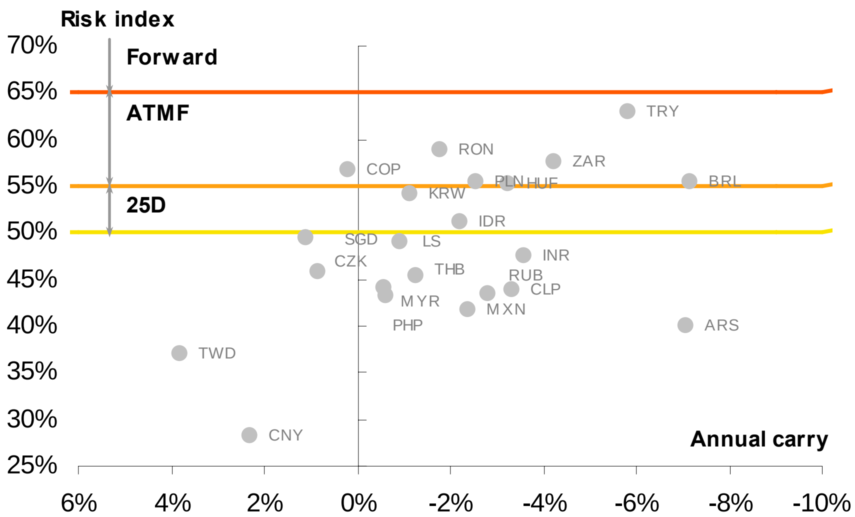
EWS risk indices vs 3M ann. cost of USD carry



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* - If the annual carry in the hedge is more than -10% (i.e. the annualised cost of hedging EM exposures is more), then increase the thresholds for each hedge trigger by 1 percentage point that the cost of carry exceeds -10%.

Appendix

Introduction to the EWS

Model Parameters

- The EWS is a set of indices that measure economic and financial stress in 22 emerging market economies:
  - The risk indices use 12 inputs that have historically been good predictors of currency weakness.
- The risk indices are calculated as percent ranks*, normalising each country's inputs onto a common scale. The percent rank measures stress on a relative scale: for a variable to indicate high stress, it needs to deteriorate relative to its own history, as well as other economies.
- The EWS risk indices vary between 0% (low stress) and 100% (high stress):
  - The theoretical mean of the percent rank is 50%. Risk indices above this level indicate above average stress;
  - Due to the large number of inputs, extreme values of the indices have been rare. Most risk indices have historically fallen between 25% and 75%.
- The same 12 inputs are used for all 22 economies, if available. The inputs are weighted equally.
- The same methodology is used across all economies, making the indices comparable to each other.
- We have combined the levels and changes in the risk indices with the cost of carry to provide a transparent, rules-based framework for determining optimal EM currency hedges.

Key Characteristics

Currencies covered	22 currencies (5 LatAm / 9 Asia / 8 CEEMEA): ARS, BRL, CLP, COP, MXN, CNY, INR, IDR, TWD, KRW, MYR, PHP, SGD, THB, RUB, CZK, HUF, ILS, PLN, RON, ZAR and TRY.
Update frequency	Monthly (end of month)
Inputs	12 Leading Indicators (6 economic and 6 financial)
Access to signal	Bloomberg: **CIGV** <GO> and monthly e-mail updates

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* - Percent rank shows the rank of a value in a data set as a percentage of the data set. The percent rank of the minimum is 0%, median is 50% and maximum is 100%.

EWS Economic Indicators

Direction of stress

External financing need or surplus. We use the sum of the current account balance and net foreign direct investment flows, normalised by GDP, as an indication of the external financing need. If local economic conditions deteriorate or global risk aversion rises, foreign investor may be less willing to finance the external deficit, leading to currency weakness;

Money supply. Increased supply of the currency may lead to a weaker exchange rate. Fast money growth is particularly risky if the central bank's reserves are low or falling, reducing its ability to manage the potential weakening of the currency;

Industrial production. Low or falling industrial production growth is a sign of economic weakness, which may require a weaker currency to revive demand;

Exports. Low or falling export growth indicates either reduced competitiveness or lower foreign demand. Currency weakness may be required to restore demand for exports;

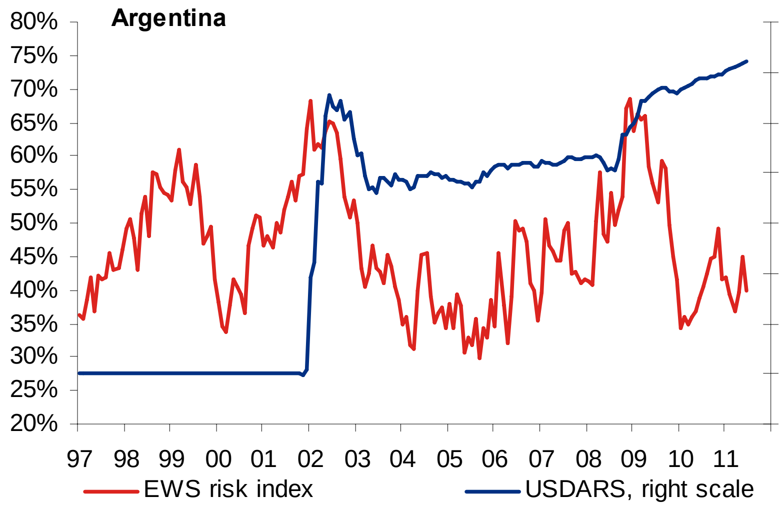
Loan-to-deposit ratio of the financial sector. This variable indicates how much of the assets of the financial sector are covered by the more 'safe' deposit financing. A highly leveraged financial sector is a risk to the economy and currency;

Short-term debt. Short-term foreign liabilities of the financial sector (we use consolidated liabilities to BIS banks), normalised by the value of FX reserves, is a source of risk if local or global economic conditions deteriorate.

EWS Financial Indicators

Direction of stress	
↑	**Implied currency volatility.** The volatility implied by currency options prices is a measure of market's expectation of future exchange rate uncertainty. Periods of high implied volatility have historically been consistent with weak EM currencies;
↑	**CDS spread.** The CDS spread measures the market's perception of sovereign default risk. High risk of default discourages foreign investment and demand for local currency;
↓	**Equity prices.** Poor performance of the local equity market indicates deteriorating outlook for corporate earnings and weaker economic conditions, which may require a lower exchange rate to restore profitability. Weak equities also discourage foreign investment flows;
↓	**Economic surprises.** Worse than expected data releases may deter foreign investors, lead to financial outflows or indicate a cyclical downturn, all of which may weigh on the currency. We use the Citi Economic Surprise Indices to measure aggregate data surprises;
↑	**Global risk.** A rise in global risk aversion typically leads to increased home bias and outflows from risky emerging market economies. Countries that have been the biggest recipients of short term foreign inflows, are most at risk. We use the Citi long-term Macro Risk Index to measure global risk aversion and combine it with data on balance of payments portfolio liabilities, normalised by FX reserves. The importance of portfolio flows in indicating stress is a positive function of the risk aversion indicator;
↑	**Real Effective Exchange Rate.** Real appreciation (higher relative inflation and/or stronger exchange rate) relative to the main trading partners reduces competitiveness and may require a weaker nominal currency going forward.

Historical EWS: Argentina, Brazil, Chile and Colombia



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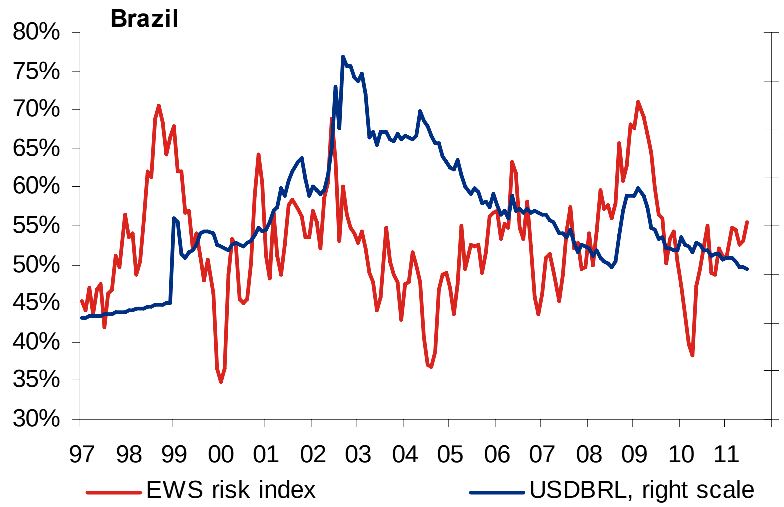

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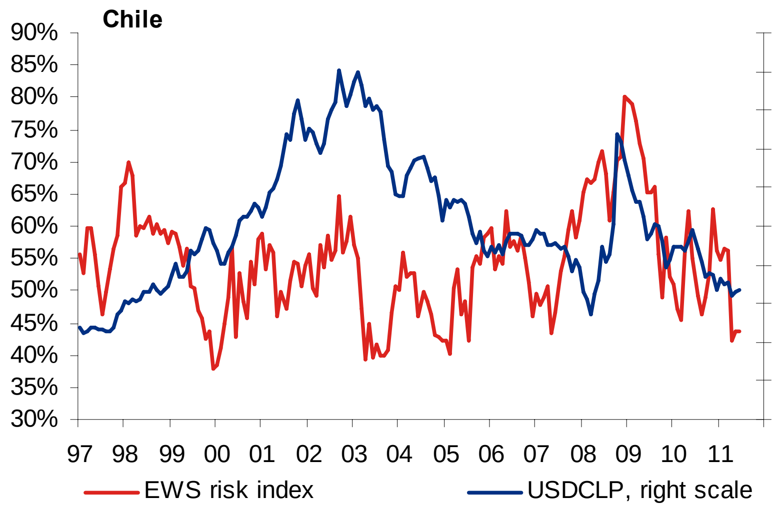

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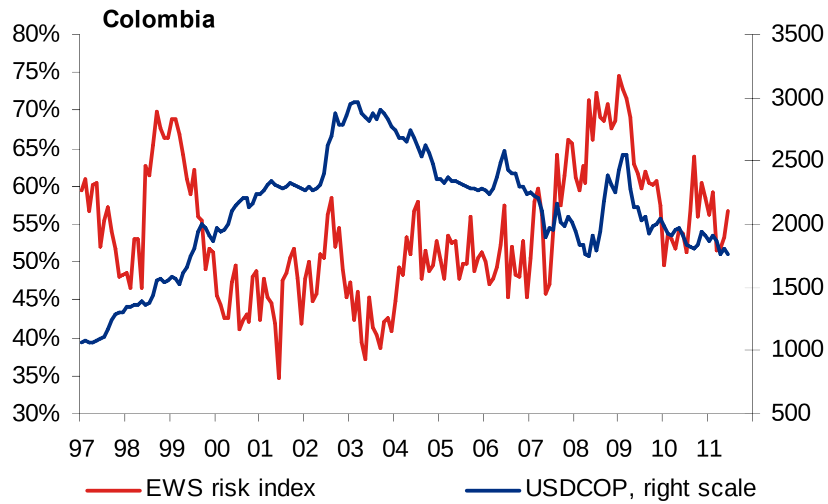

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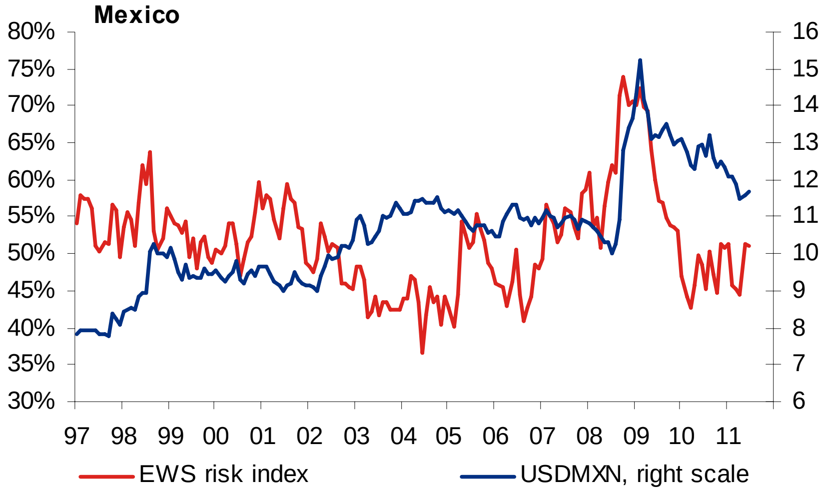
Historical EWS: Mexico, China, India, Indonesia



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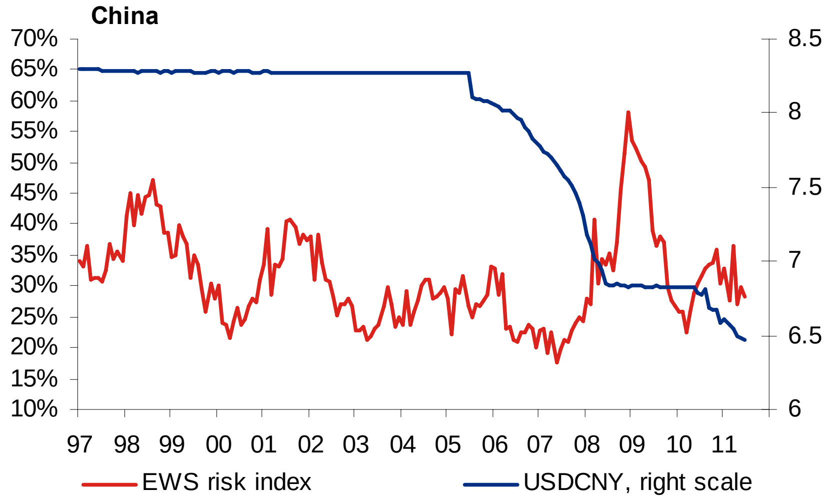

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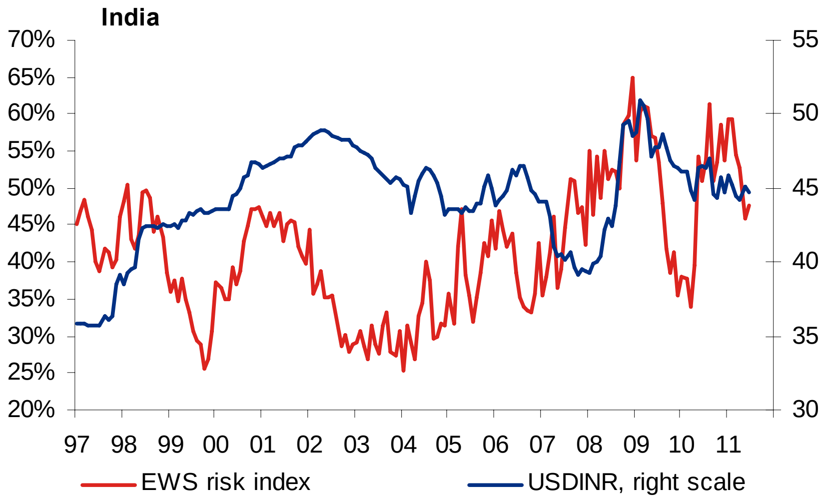

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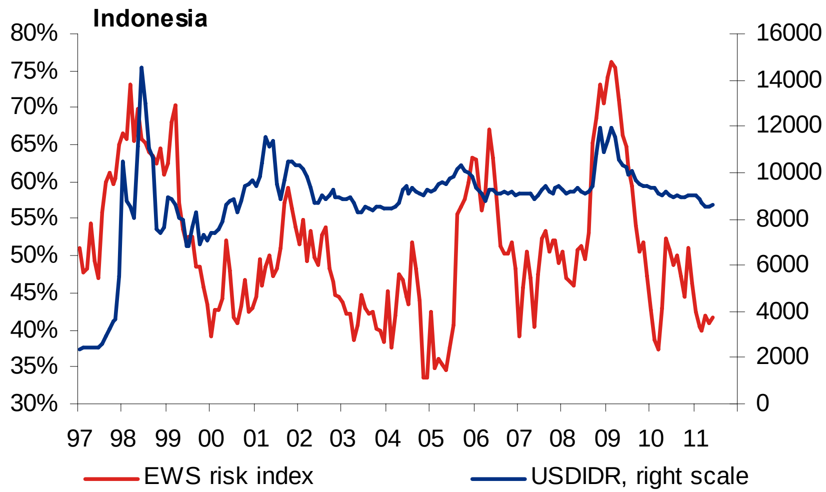

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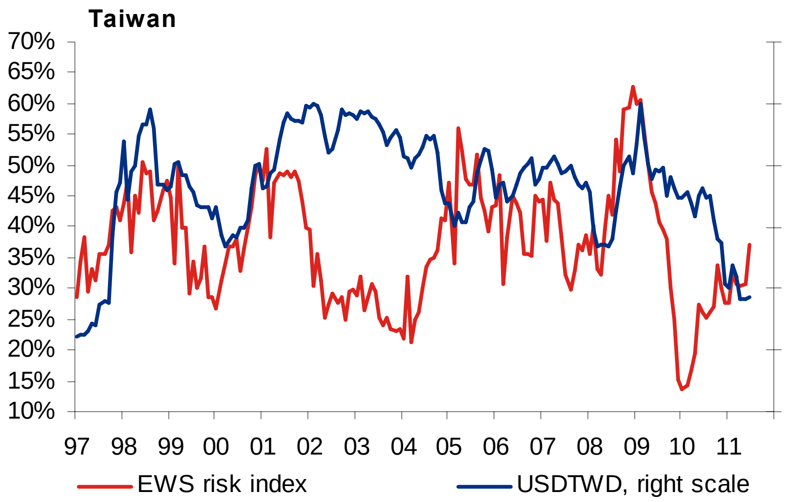
Historical EWS: Taiwan, Korea, Malaysia, Philippines



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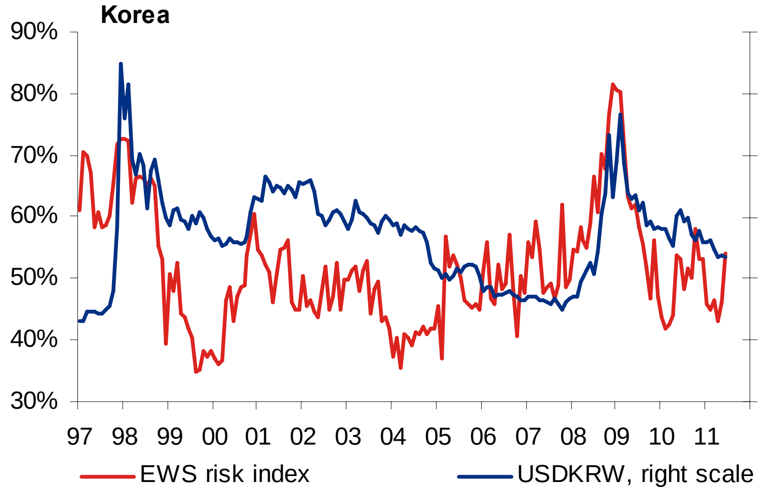

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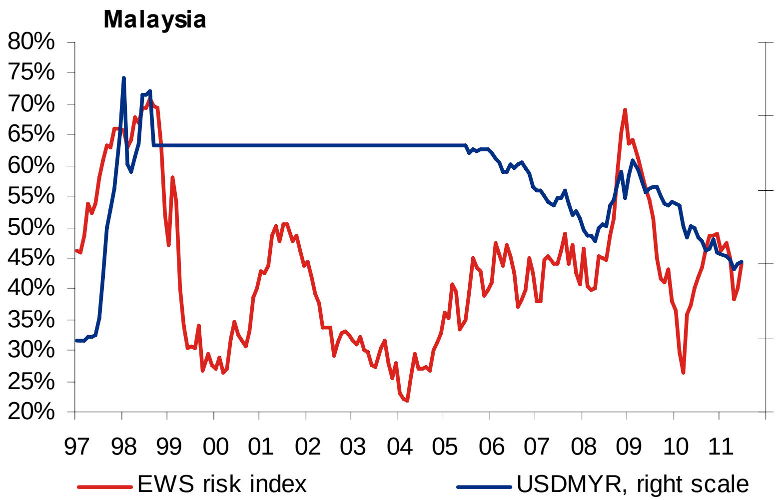

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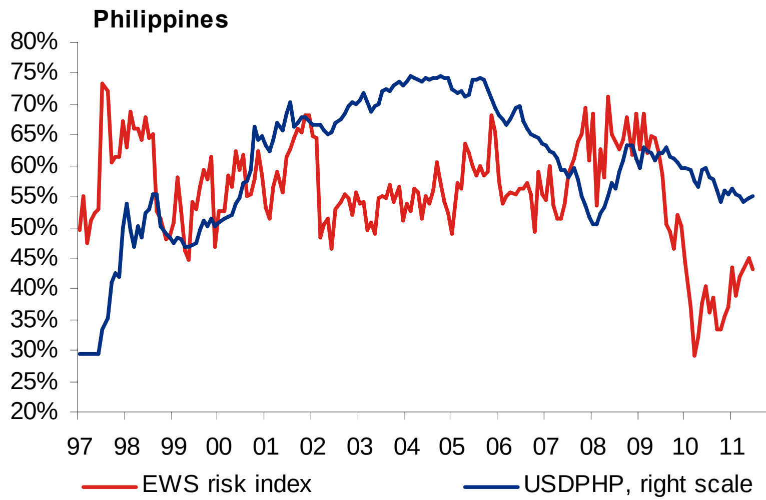

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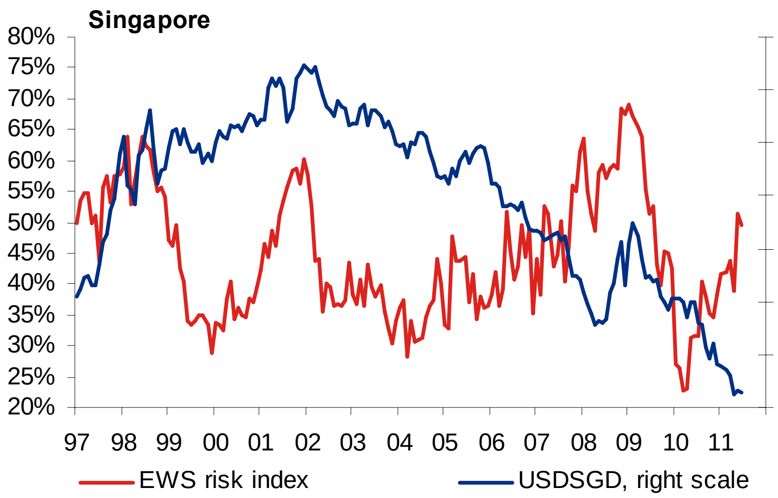
Historical EWS: Singapore, Thailand, Russia, Czech Republic



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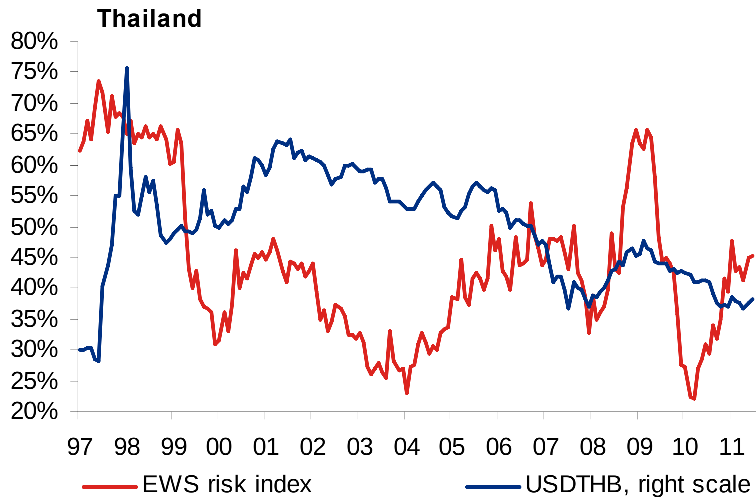

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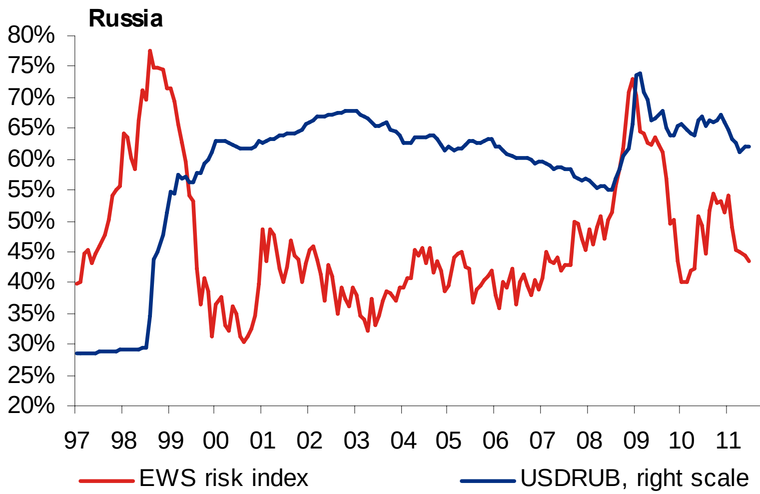

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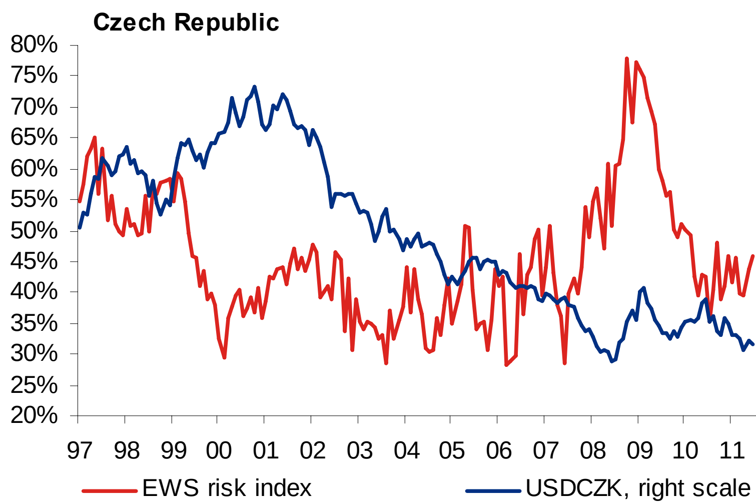

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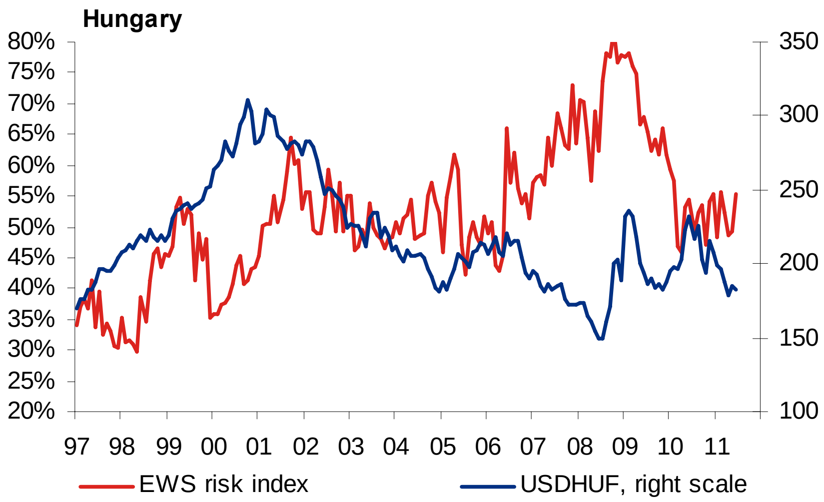
Historical EWS: Hungary, Israel, Poland, Romania



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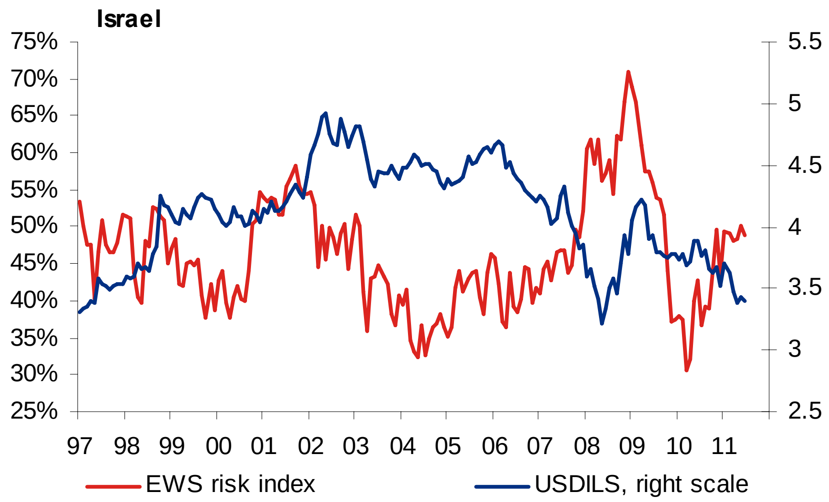

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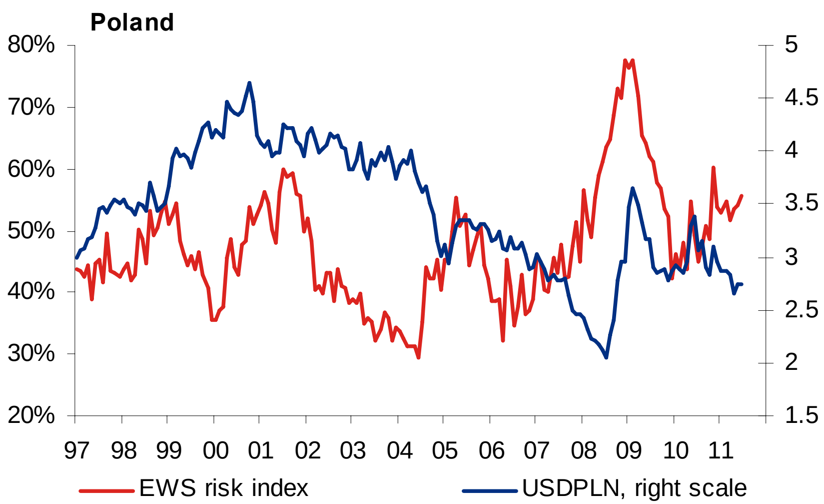

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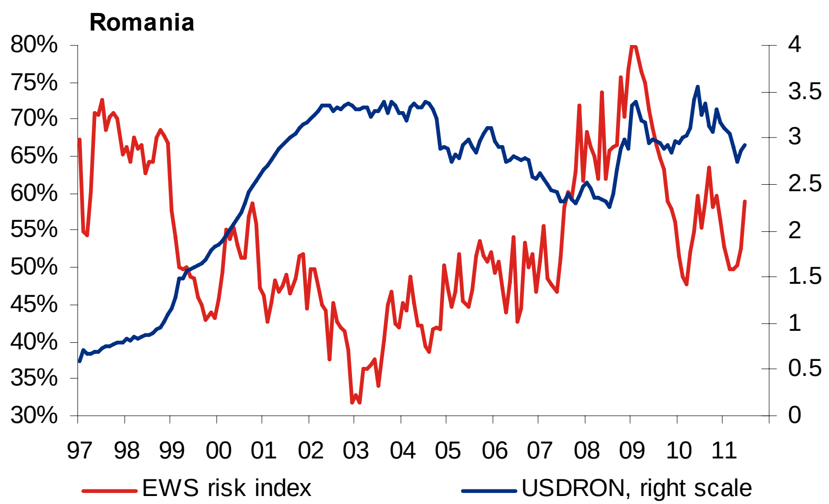

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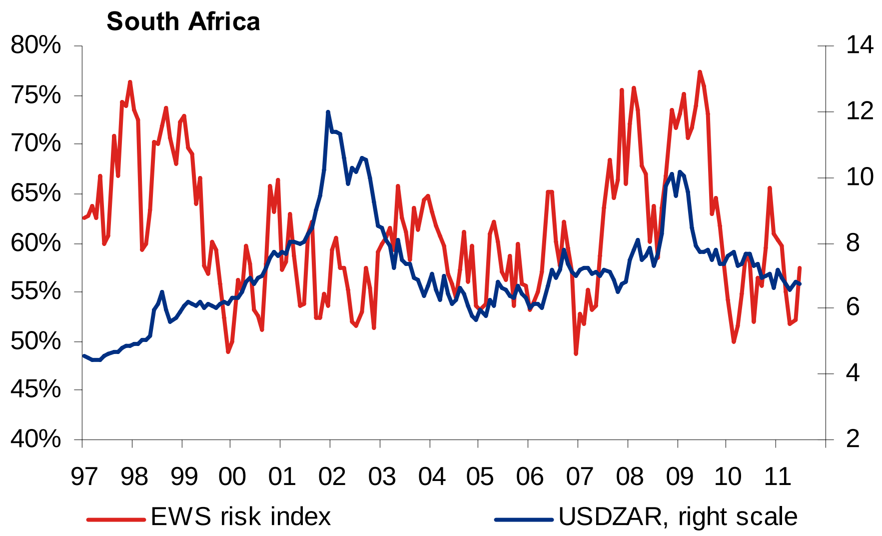
Historical EWS: South Africa, Turkey



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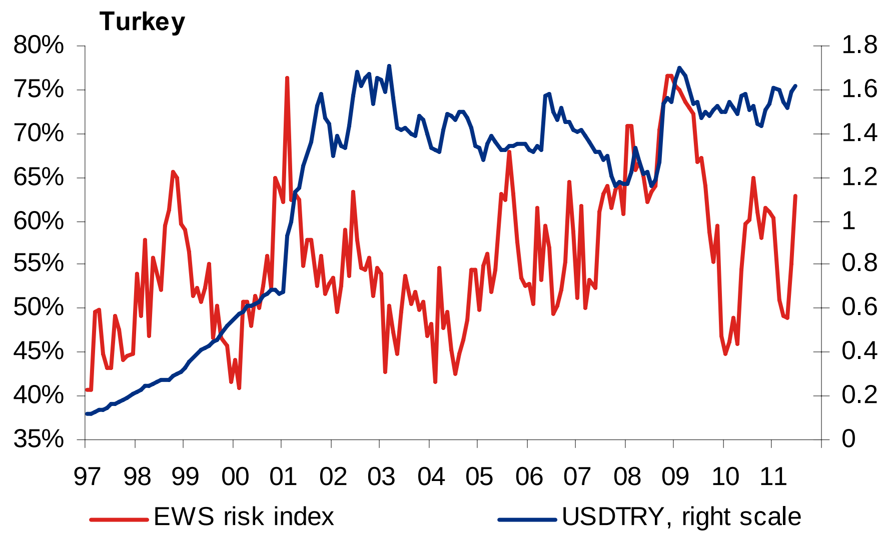

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