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Latin America – When prices determine fundamentals

We develop financial conditions indices (FCIs) for Brazil, Mexico, Colombia as well as Chile, and calculate the likely impact on growth given the tightening in financial conditions since April. Growth will likely fall in all countries and Brazil may experience a recession by the end of this year.

In our recent analysis of the likely impact of eventual monetary policy normalization in the U.S. on emerging markets (see "Back to the future: 1994"), we analyzed how changes in U.S. Treasury yields and the expansion of the Fed's balance sheet impact portfolio flows. The literature has shown that exogenous shifts in capital flows ("bonanzas" alternating with "sudden stops") are a main determinant of growth for EM economies at a business cycle frequency. The exact transmission mechanisms from changes in capital flows (actual and expected) to growth will occur through a variety of channels, such as lending spreads, asset prices and credit growth. The lag time and size of the impact will then depend on the particular details of each country's financial system and its relationship to the real economy.

The events of the last two months represent, for the region, a tightening of financial conditions. **To measure the likely impact on growth, we have calculated FCIs for Brazil, Mexico, Colombia and Chile.** These indices not only allow us to estimate the marginal impact on growth of tightening financial conditions since April, but will also allow us to measure in real time financial conditions as markets react to changes in U.S. monetary policy.

Financial Conditions Index for Latin America

To formulate our index, we first gathered, for each country, **a series of variables that likely represent the state of financial conditions**. In the case of Brazil, for example, we include the level of the Bovespa equity index, the level of BRL, 5yr sovereign CDS, the CRB metal index, average corporate and individual lending spreads, real growth in money supply (M2), 2yr spread in the DI interest rate swap curve, as well as lending growth for both private and public banks (Appendix 1). The data set has been updated as of the last week of June.

We use **principal component analysis** to extract from this data one common factor, the first principle component, which explains 43% of the covariance between the above variables in the case of Brazil and 40% in the case of Mexico.

To gauge overall financial conditions we also have to take into account policy variables, specifically monetary policy. To do this, we run a regression of growth on the policy interest rate and the first principal component. In the case of Brazil, we find that the real Selic policy rate (lagged 6 months) and the first principal component (lagged 3 months), **explain 86.3% of the variation in the monthly GDP proxy (IBC-Br) from July 2005 to April 2013** (Appendix 2). We then use the estimated coefficients to calculate a weighted average of real policy rate (34% of the

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index) and the first principal component (66% of the index) to generate our FCI, which we present in standardized form (Table 1, Figure 1).

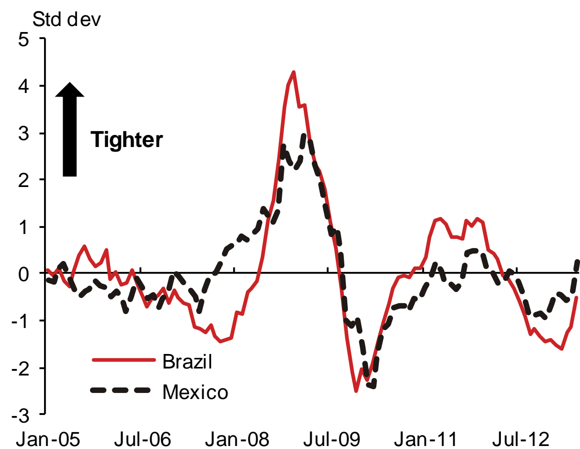
Table. 1: FCI for Brazil, Mexico, Colombia and Chile – details and recent changes

	FCI weight (%) - real policy rate	FCI weight (%) - 1st principal component	FCI level - April (s.d.)	Δ April to June (s.d.)	Impact on growth in 6m (pp)	Growth after full impact of the shock (% y-o-y)
Brazil	34	66	-1.26	0.74	**-0.92**	**-0.46**
Mexico	22	78	-0.55	0.81	**-1.50**	1.40
Colombia**	23	77	0.35	0.19	**-0.10**	3.30
Chile	31	69	1.05	0.33	**-0.80**	3.15

Note: Impact on growth for Colombia is over the next 12 months. Growth after full impact of the shock varies country-by-country depending on different lag structures of the regression. Source: Nomura

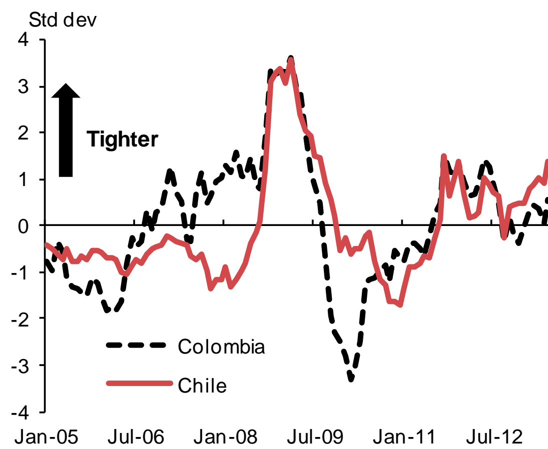
In the case of **Brazil**, we see that financial conditions trail a volatile path since 2005, tightening massively around the 2008 crisis and then easing significantly in H2 2009. This year, looking at changes to the 3m average, we see conditions have tightened by 0.6 standard deviations (s.d.) in June alone (Figure 3), or 1.08 s.d. from the levels seen in March. Plugging these changes in conditions into our GDP regression, the tightening is expected to reduce growth by 0.92 percentage points (pp). In fact, **the model indicates that the economy could be facing a "technical" recession by December this year, with growth falling to -0.46% y-o-y** (Table 1).

Fig. 1: FCIs for Brazil and Mexico



Source: Nomura

Fig. 2: FCIs for Chile and Colombia



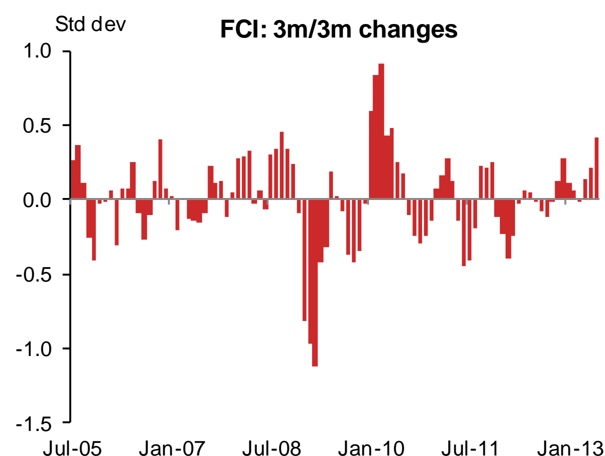
Source: Nomura

In case of **Mexico** it is interesting to note how fast the financial conditions impact growth. The lag on financial conditions is between 3 and 4 months for Mexico as compared to up to 6 months in Brazil and more than 12 months on Colombia. In Mexico the financial conditions started to ease through July last year until April, but lately we have seen the conditions tightened by 0.81 standard deviations since April, with the yield curve steepening by more than 100bp, equity index falling by more than 10% since April. **The GDP model based on the FCI suggests that tightening of financial conditions could reduce the annual growth forecast by 1.5%, with 2013 growth falling to 2%.** This, of course, does not take into account a likely improvement in the US economy and a normalization of public spending in Mexico after delays in H1.

For **Colombia**, during the first five months of 2013 the FCI showed a tightening, with a spike in June due to the recent market turmoil. Indeed, in June the index tightened 0.18 standard deviation compared to its April levels. In Colombia, the regression shows the smallest and more lagged FCI impact on GDP growth in the region. In fact, **the impact on GDP will be felt one year from now and the growth reduction would be of only 0.1%**. We believe the muted impact reflects structural changes in security conditions which generated important FDI flows and improvements in

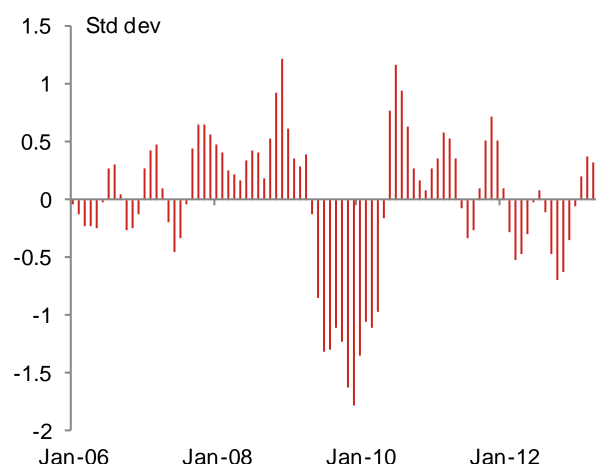
consumption in the past decade. These improvements might have masked the true impact of negative financial shocks on growth.

Fig. 4: Brazil – 3m/3m change in FCI



Source: Nomura

Fig. 5: Mexico - 3m/3m change in FCI



Source: Nomura

For **Chile**, financial conditions have tightening continuously since last fall, and is **on course towards the most restrictive level since the 2008-09 crisis**, an ominous sign at a time when growth is decelerating sharply. This was initially the result of rising real policy rates as inflation fell rapidly (real rates climbed by 1.4 s.d. from September through February), and more recently due to falling copper and equity prices. Overall conditions were 1.3 s.d. tighter from September to April, and moved another 0.3 s.d. since then. **This is expected to shave 0.8pp off GDP growth, with the economy expanding just above 3% y-o-y in Q1 2014**, well below trend (c.5%). Very tight financial conditions strengthen our conviction of at least 50bp of rate cuts by the Central Bank of Chile this year, especially in a context of "tighter international conditions facing merging economies" (to quote the June minutes) and the current low inflation scenario.

Conclusion: When prices determine fundamentals

Typically, we think of financial prices as reflecting consensus views over future fundamentals. But in the case of EM economies, especially Latin America where domestic savings are low and current account deficits often high, large exogenous changes in external liquidity conditions can generate unexpected variations in financial conditions that change the path of economic fundamentals.

As we noted in our "Back to the future: 1994" piece, the impact of lower capital flows on growth will be a key determinant of structural vulnerability going forward, specifically the risk of negative feedback between lower growth, balance sheet constraints and fiscal performance. **Our indices for the four countries show that events of the last two months have already caused a meaningful tightening of financial conditions which will have a material impact on growth** in the cases of Brazil, Mexico and Chile. In the case of Brazil, our results suggest that growth could become negative by the end of this year.

We would note that taking into account changing financial conditions is a necessary but not sufficient condition to formulate a growth forecast. Nonetheless, by incorporating the market's implicit expectations for the future path of policy and other exogenous variables, financial conditions indices offer a very compact summary of available information, as can be seen by the very "R squared" of our growth regressions. We will be updating our growth forecasts using our new FCI in a follow up publication.

Appendix 1: List of variables for principal components analysis (PCA) and their changes since April

Brazil			Mexico		
Variables for PCA	**April levels**	**∆ since April**	**Variables for PCA**	**April levels**	**∆ since April**
CRB metal prices (index)	856.8	-3.7%	Brent ($/bbl)	102.4	-1.2%
5yr CDS (bp)	109.7	83.4	IPC equity index	43172.8	-13.1%
BOVESPA equity index	55910.4	-11.7%	Consumer Confidence (Index)	95.7	-0.5%
BRL	2.0013	-9.0%	MXN	12.2249	-8.8%
Corp lending spread (%)	14.1	-0.9%	Yield spread (bp)	39.0	101.0
Individual lending spread (%)	25.5	-0.3%	5yr CDS (bp)	82.6	74.0
Real M2 growth (% y-o-y)	2.2	-0.3%			
DI swap spread (bp)	115.4	133			
Private credit growth (% y-o-y)	6.3	0.1%			
Public credit growth (% y-o-y)	28.8	-0.5%			
Colombia			**Chile**		
Variables for PCA	**April levels**	**∆ since April**	**Variables for PCA**	**April levels**	**∆ since April**
Brent ($/bbl)	102.4	-1.2%	Copper ($/lb)	318.8	-4.2%
5yr CDS (bp)	82.0	69.0	5yr CDS (bp)	64.9	34.6
COP	1824	-5.4%	CLP	471.04	-6.8%
Annual credit growth (% y-o-y)	18.3%	-3.0%	Annual credit growth (% y-o-y)	10.4	-0.8%
IGBC equity index	13390.3	-6.3%	IPSA equity index	4292.1	-7.7%
Lending spread (%)	11.4	-0.9%	Real M2 growth (% y-o-y)	8.6	-0.8%
Yield spread (bp)	131	53.0	Yield spread (bp)	20	15.0

Source: Nomura.

Appendix 2: Regressions forecasting GDP growth with principal components and policy rate

Brazil			Mexico		
Dependent variable: GDP growth (y-o-y)			**Dependent variable: GDP growth (y-o-y)**		
Independent variables	**Coefficient**	**P-value**	**Independent variables**	**Coefficient**	**P-value**
Constant	4.3840	0.0000	Constant	1.7116	0.0000
Change in real Selic (-6)	-0.7195	0.0009	GDP YoY (-3)	0.3194	0.0000
Principal component (-3)	-1.4427	0.0000	Change in 1st principal component (-3)	-1.1894	0.0000
Dummy (for sudden stop)	-4.3429	0.0000	Change in real policy rate (-4)	0.2168	0.0397
R-squared	86.8%		**R-squared**	72.6%	
S.E. of regression	1.24		**S.E. of regression**	2.00	
First principal component explains 43% of the movements in all candidate variables			*First principal component explains 40% of the movements in all candidate variables*		
Colombia			**Chile**		
Dependent variable: GDP growth (y-o-y)			**Dependent variable: GDP growth (y-o-y)**		
Independent variables	**Coefficient**	**P-value**	**Independent variables**	**Coefficient**	**P-value**
Constant	4.5488	0.0000	Constant	4.6032	0.0000
GDP growth (y-o-y) (-13)	-0.2349	0.0000	Change in real policy rate (-7)	0.6600	0.0421
1st principal component (-12)	-0.3969	0.0000	1st principal component (-6)	-1.1200	0.0000
1st principal component (-18)	-0.2278	0.0000	Dummy (for 08-09 crisis)	-5.7200	0.0000
1st principal component (-24)	-0.4895	0.0000			
Real policy rate (-6)	0.2430	0.0000			
Dummy (for 08-09 crisis)	-2.6700	0.0000			
R-squared	88.8%		**R-squared**	65.6%	
S.E. of regression	0.63		**S.E. of regression**	1.83	
First principal component explains 40% of the movements in all candidate variables			*First principal component explains 37% of the movements in all candidate variables*		

Note: For Brazil, GDP growth is 3m moving average in order to smoothen the volatile IBC-Br monthly GDP series. Source: Nomura

Disclosure Appendix A-1

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