Assessing Country Risk: Selected Approaches[1]

D.   Financial Risks

I. Interbank Access[2]

Motivation

This tool seeks to capture whether banks might be facing liquidity challenges by capturing signs of difficulties in accessing wholesale funding.

Methodology

For non-euro-area countries covered, the indicator focuses on the behavior of the LIBOR-OIS spread and the spread of LIBOR to 3-month T-Bills. This spread in effect isolates the default risk counterparties face in the LIBOR market, and reflects the ease with which banks can access unsecured funding. The assessment of market stress is based on the z-scores of the level and one-month volatility of the spreads (calculated relative to the pre-crisis period). The relative distance for each one of the four indicators is expressed in multiples of standard deviations, and the most conservative of the z-scores is used for the assessment.

For the euro-area countries (where country-specific indicators do not exist), the indicator captures banking system reliance on ECB funding in excess to the norm prior to crisis. Excessive reliance on central bank funding can indicate challenges with market funding access to support the current asset base.

Data sources

Bloomberg and Haver (use of ECB liquidity and bank assets).

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[1] This document provides technical background and extended descriptions of the cross-country risk assessment tools discussed in the IMF reference note "Assessing Country Risk: Selected Approaches." It should not be reported as representing the views of the IMF. The views expressed are those of the authors and do not necessarily represent those of the IMF or IMF policy. The document describes research in progress as of June 2017, and is intended to elicit comments and to further debate.

[2] Contributing author: Jesse Eiseman (MCM), based on work by Brenda Gonzalez-Hermosillo and Heiko Hesse.

II. Fundamentals-implied CDS (FICDS)[3]

Motivation

The aim of the FICDS is to estimate a shadow CDS spread for a wide range of individual banks. Individual bank spreads are then aggregated into a country-level indicator using an asset-weighted average.

Methodology

Following Ötker-Rode and Podpiera (2010), the FICDS spreads are constructed as a linear combination of bank level financial indicators, i.e., the net interest margin, the share of trading income in revenues, the efficiency ratio (all increasing risk premium), and the return on assets (lowering risk premium).

The financial indicators are obtained from Bloomberg[4]. Specifically,

- *Return on Assets* = Trailing 12-month Net Income / Average Total Assets * 100, where the denominator is the average of the beginning balance and ending balance.

- *Efficiency Ratio* = Operating Expenses / (Net Interest Income + Commissions & Fees Earned + Other Operating Income (losses) + Trading Account Profits (Losses) – Commissions & Fees Paid + Taxable Equivalent Adjustment or (Net Revenue – Net of Commissions Paid) * 100

- *Net interest Margin* = (Trailing 12-month Net Interest Income + Trailing 12-month Other Investments and Assets Sale) / (Earning Assets + Prior Year Earning Assets) / 2) * 100

- *Share of Trading Income in Revenues* = Trading Account Profits (Losses) / (Trading Account Profits (Losses)+ Net Interest Income + Commission & Fees Earned) * 100

The weights on these indicators are based on estimating the following CDS model on large financial institutions during 2004–08 using the dynamic panel Arellano-Bond (1991) two-step estimation procedure:

$$CDS_{i,t} = \rho CDS_{i,t-1} + X_{i,t}'\beta + Z_t'\gamma + u_{i,t} ,$$

where $CDS_{i,t}$ is the CDS spread for bank i at time t, $CDS_{i,t-1}$ is its one-period lagged value, and ρ measures the persistence. Further, $X_{i,t}$ stands for the vector of bank specific financial and market indicators and β contains corresponding sensitivities. Factors Z_t represent common determinants of

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[3] Contributing author: Yingyuan Chen (MCM), based on work by Inci Ötker-Robe and Jiri Podpiera.

[4] Bloomberg fields of related variables are provided at the end.

banks' CDS (at the sample and country level) and γ contains the associated parameters. The error term $u_{i,t}$ includes a white noise and a bank-specific credit risk factor.

Data sources

Bloomberg, IMF Financial Soundness Indicators, and bank reports.

Bloomberg fields of related variables	
Commissions & Fees Earned	IS_COMM_AND_FEE_EARN_INC_REO
Commissions & Fees Paid	IS_COMM_FEE_PAID
Earning Assets	EARN_ASSET
Efficiency ratio	EFF_RATIO
Net Interest Income	NET_INT_INC
Net Interest Margin	T12_NET_INT_MARGIN
Net Revenue - Net of Commissions Paid	NET_REV_EXCL_COMMISSIONS_PAID
Operating Expenses	IS_OPERATING_EXPN
Other Operating Income (losses)	IS_OTHER_OPER_INC_LOSSES
Return on assets	RETURN_ON_ASSETS
Trailing 12-month Net Interest Income	TRAIL_12M_NET_INT_INC
Trailing 12-month Taxable Equivalent Adjustment	TRAIL_12M_TAX_EQV_ADJ
Trading Account Profits (Losses)	IS_TRADING_ACCT_PROF
Taxable Equivalent Adjustment	IS_TAX_EQV_ADJ

Reference

Ötker-Rode, İnci, and Jiri Podpiera. 2010. "The Fundamental Determinants of Credit Default Risk for European Large Complex Financial Institutions." Working Paper 10/153, International Monetary Fund, Washington.

III. Credit Cycle Indicator[5]

Motivation

Excessive growth in credit has been found to be a leading indicator of systemic banking crises. Determining where a country stands in the credit cycle can help identify whether credit is excessive or not.

Methodology

Rapid credit growth is a forward-looking indicator of banking-sector stress, given that it is usually accompanied by relaxation of lending standards and the build-up of potential credit

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[5] Contributing author: Jesse Eiseman (MCM), based on work by Srobona Mitra and Silvia Iorgova.

risks. Two types of credit aggregates are frequently monitored as indicators of systemic risk by policymakers and the Fund and other international policy institutions: the 'gap' and the 'growth'. The gap refers to the deviation of the credit/GDP ratio from its (backward-looking) estimated trend, whereas the growth refers to the annual change in the credit/GDP ratio in percentage points. In this tool, the gap is estimated based on fitting a 30-quarter backward looking quadratic trend on a rolling window basis, and expressed in terms of standard deviations (Dell'Ariccia and others, 2012).

Recent analytical work has identified potential thresholds on gaps and growth that signal banking crises 2-3 years ahead. For instance, a gap of 1.5 standard deviations is used in detecting bubbles (Drehmann et al. (2011) and Dell' Ariccia et al. (2012)); this threshold has been determined as minimizing the noise-to-signal ratio by issuing a fewer number of false positive signals. However, given the challenges in accurately identifying the trend, it is useful to complement this with the more readily observed growth indicator. Similarly, an annual growth of the credit/GDP ratio of 3 percentage points has been shown to have much less chance of missing a crisis (IMF, GFSR, 2011). As suggested in Arregui and others (2013), such thresholds on the credit gap and credit-to-GDP growth can be used to alert policymakers about the potential need for early policy action.

Data sources

Data on credit is sourced primarily from the BIS (total credit or bank credit to non-financial private sector, depending on availability) (through Haver); whenever BIS data is unavailable IFS data on bank credit to the private sector is used.

IV. Structural Balance Sheet Risks and Bank Buffers[6]

Methodology

Assessment of balance sheet soundness is based on the average of an indicator of riskiness of the balance sheet structure and an indicator of the quality of bank buffers. The analysis is undertaken at the country level using reported financial soundness indicators. Thresholds have been determined based on analysis undertaken by the GFSR and the Basel Committee on Banking Standards (BCBS), as well as staff experience in financial sector surveillance.

This tool assesses the riskiness of each banking sector's balance sheet is assessed across three dimensions—the deposit-to-loan ratio; the percentage of foreign currency assets; and the percentage of foreign currency liabilities. The assessment seeks to capture the aggregate exposure of the system to potential problems in the future.

Deposit-to-loan (DTL) ratio

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[6] Contributing author: Jesse Eiseman (MCM), based on work by Srobona Mitra and Silvia Iorgova.

Deposits have been shown to be a more stable source of funding relative to market sources— higher deposits generally indicate a relatively low risk of a liquidity crisis (absent a deposit run).

Percentage of FX assets and liabilities (FX %)

Past experience of crises (especially in emerging markets) has pointed to the importance of foreign currency exposures as an indicator of future repayment problems especially when the exchange rate sharply depreciates. For the banking system, this is assessed through two filters. First, over-extending foreign currency loans can suggest future problems with asset quality as borrowers struggle to repay in the face of exchange rate pressures (or other challenges in accessing the required foreign currency). Second, banks themselves may struggle to generate sufficient foreign currency to meet their own liabilities in the face of exchange rate pressures.

Bank buffers are assessed across three dimensions—leverage ratio, profitability, and asset quality—reflecting the capacity of the overall banking system to absorb any problems, given past decisions.

Leverage ratio (LR)

This is assessed on the basis of the simple leverage ratio of capital / assets; this indicator is being increasingly adopted by macroprudential supervisors since it avoids the problems of using banks' own assessment of risk-weighted assets.

Profitability

This is a simple binary signal of whether the banking system is profitable or not, based on the return on equity and assets.

Asset quality (NPL)

This assessment is based on the rate of growth of the non-performing loan/gross loans ratio and the level of the NPL ratio relative to the distribution of a cross-country sample.

Data sources

FSI database (FSI.imf.org) and central banks. Data covers all countries that provide data to the FSI database.