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Credit-to-GDP gaps: early warning indicator for systemic banking crises

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This document has been prepared by Christian Dembiermont - BIS and will be presented under item 4 of the draft agenda

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BANK FOR INTERNATIONAL SETTLEMENTS

Credit-to-GDP gaps: early warning indicator for systemic banking crises

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The views expressed in this presentation are those of the author and do not necessarily reflect those of the BIS



Outline:

1. Background
2. Definition of credit-to-GDP gaps (CTGG)
3. Calculation of the CTGG
4. Testing alternative Early Warning Indicators
5. Total credit gaps versus bank credit gaps
6. Typical questions
7. CTGG and capital buffer



Background

- The BIS supports global monetary and financial stability
- Importance of the financial cycle
- Searching the best Early Warning Indicator to identify busts and booms in the financial cycle

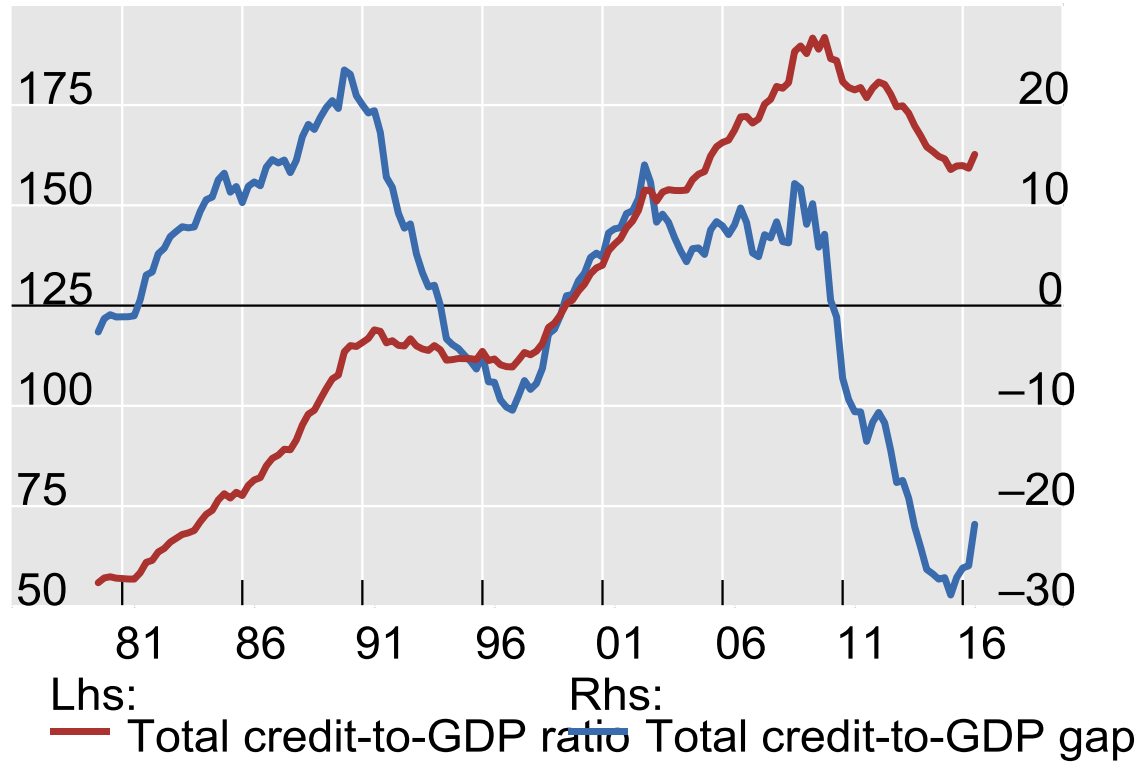


CTGG: definition

- The CTGG is defined as
 - the difference between the credit-to-GDP ratio and its **long-run trend**
- The credit-to-GDP ratio is defined as
 - the ratio of "Total credit to the private non-financial sector" (PNFS) to nominal GDP
- The total credit to the PNFS is defined as
 - the total borrowing from all domestic and foreign sources (as published in the BIS database on credit <http://www.bis.org/statistics/totcredit.htm?m=6%7C326>)
(based on Quarterly National Accounts)



Credit-to-GDP ratio and CTGG



CTGG calculation

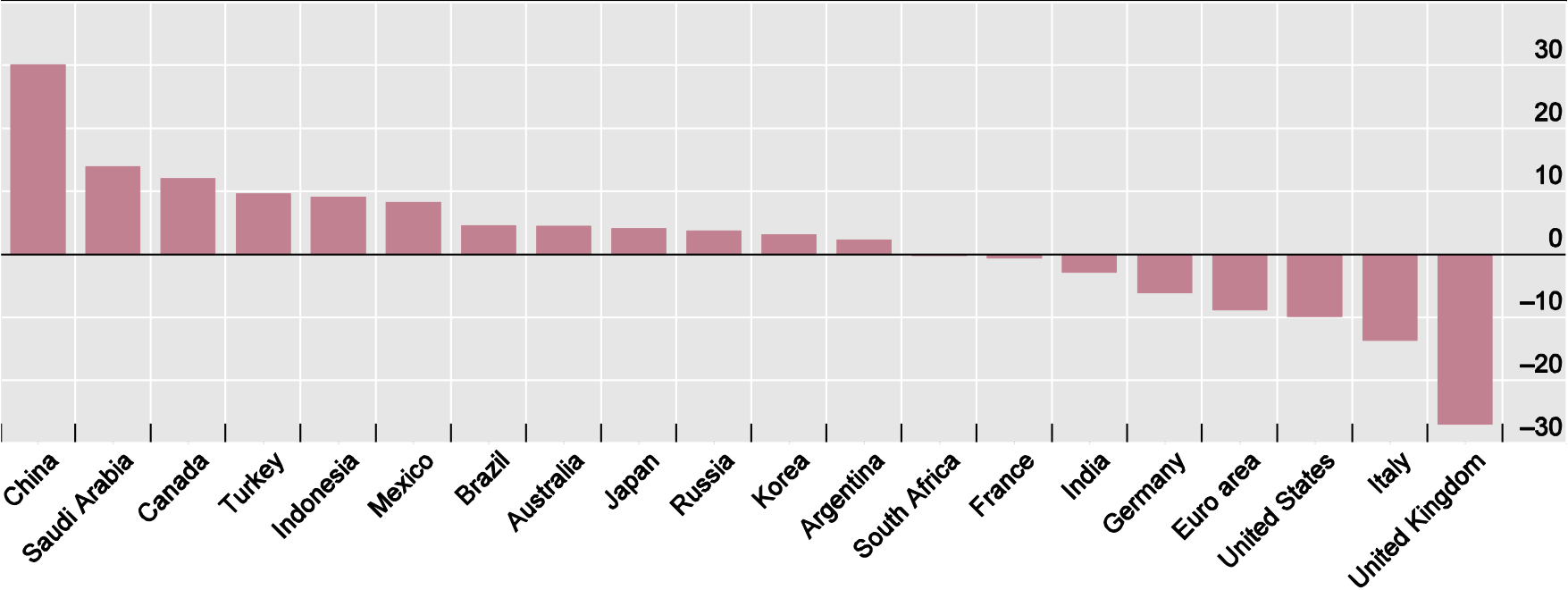
- Deviations of the credit-to-GDP ratio from a long term trend
 - Total credit-to-GDP ratio minus rolling HP trend (one-sided filter)
- Characteristics
 - Measure of the financial cycle
 - Most reliable single early warning indicator of systemic crises



Credit-to-GDP gaps in the G20

Q1-2016; in percentage points

Graph XX



Estimates based on series on total credit to the private non-financial sector. Credit-to-GDP gap is defined as the difference between the credit-to-GDP ratio and its long-term trend. Long-term trend is calculated using a one-sided Hodrick-Prescott filter with a smoothing parameter of 400,000.

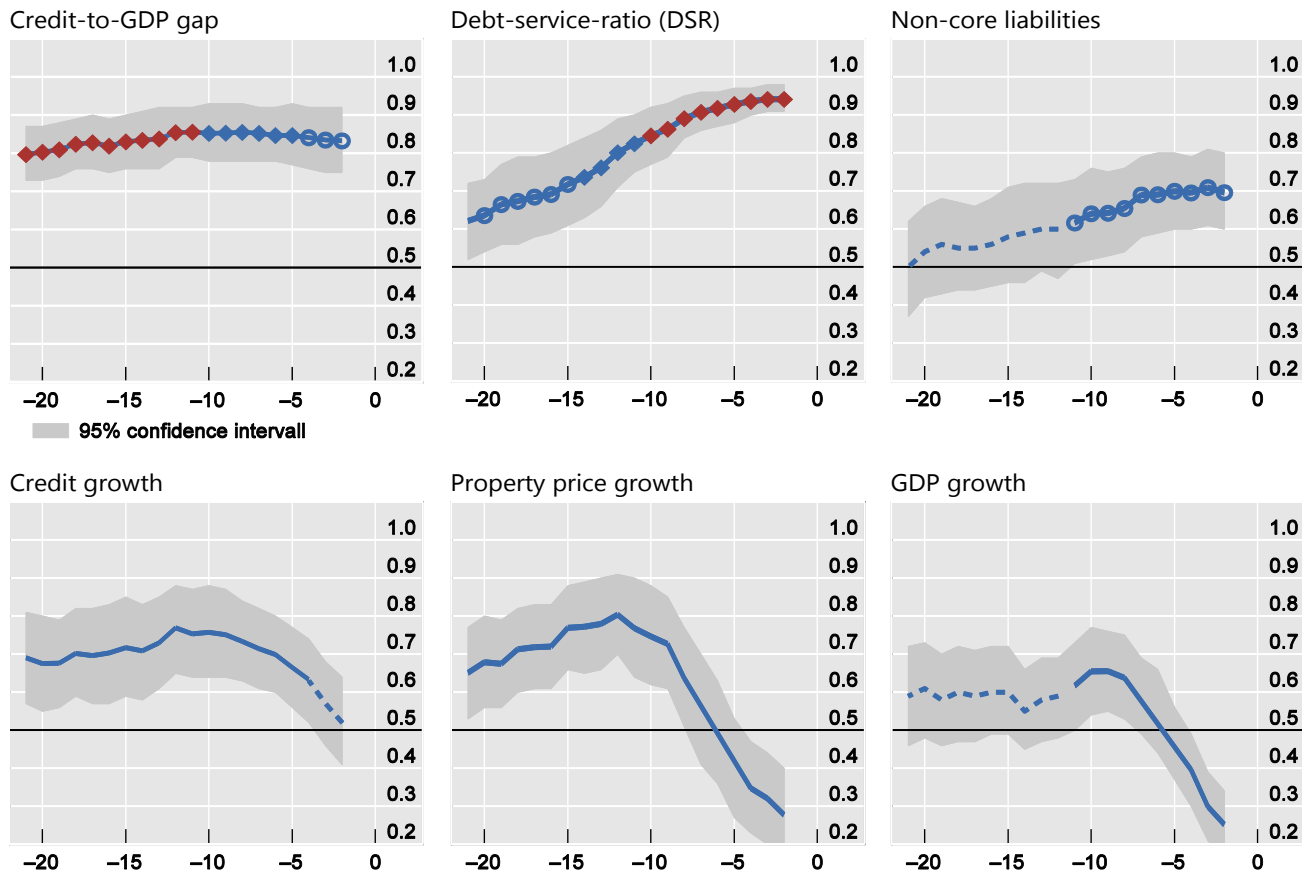


Testing alternative Early Warning Indicators

The signalling quality of different EWIs

AUCs for different forecast horizons

Graph 2



The horizontal-axis denotes the forecast horizons in quarters before crises. The vertical-axis denotes AUC. The horizontal line at 0.5 highlights the value of an uninformative indicator. A solid blue line indicates that the specific variable for the given horizon is statistically different from an uninformative indicator, while a dashed blue line indicates the opposite. A hollow blue circle shows that the signal is stable in the sense that it does not reverse direction within the forecast horizon until the crisis. Red diamonds highlight that the specific variable is statistically the best indicator for this particular horizon. Other indicators that are not statistically different from best-performing indicator are marked by solid blue circles.

Source: Drehmann and Juselius (2013).



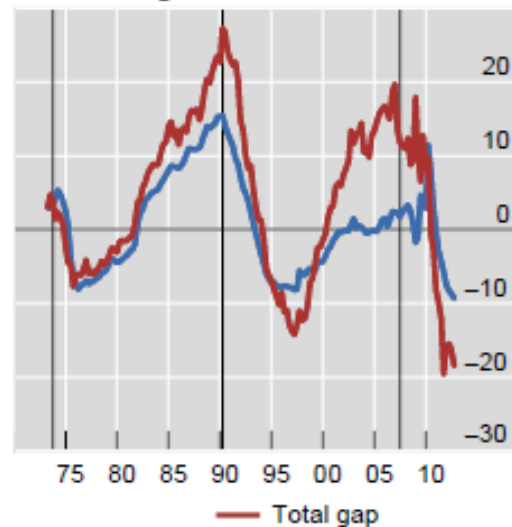
Why total credit gaps and not bank credit gaps?

Development of total and bank gaps

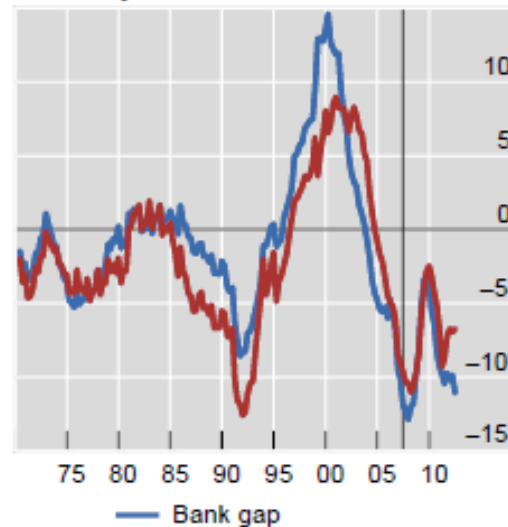
In percentage points

Graph 1

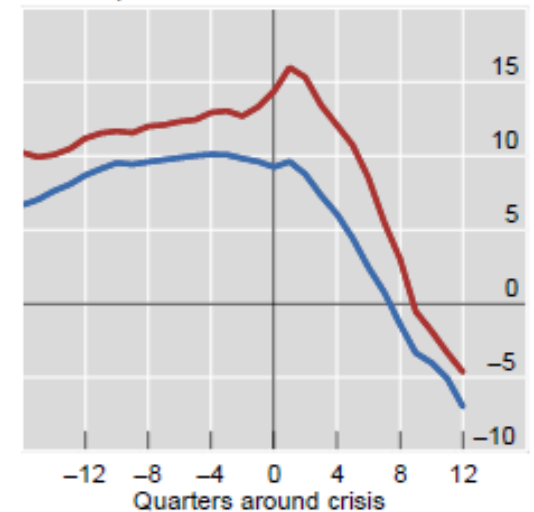
United Kingdom¹



Germany¹



Developments around crises²



¹ The vertical lines indicate the beginning of systemic crises. ² The total/bank gap corresponds to the respective averages across all observations in a particular quarter.

Sources: National data; author's calculations.



The CTGG: typical questions

- Critique 1: The gap moves countercyclical with GDP growth
 - Statistically not correct in a cross-country sample
 - Objective is not to manage GDP cycle but to increase resilience
 - But, diverging business cycles and financial cycles present challenges

Drehmann and Tsatsaronis (2014) discuss questions and critiques in detail



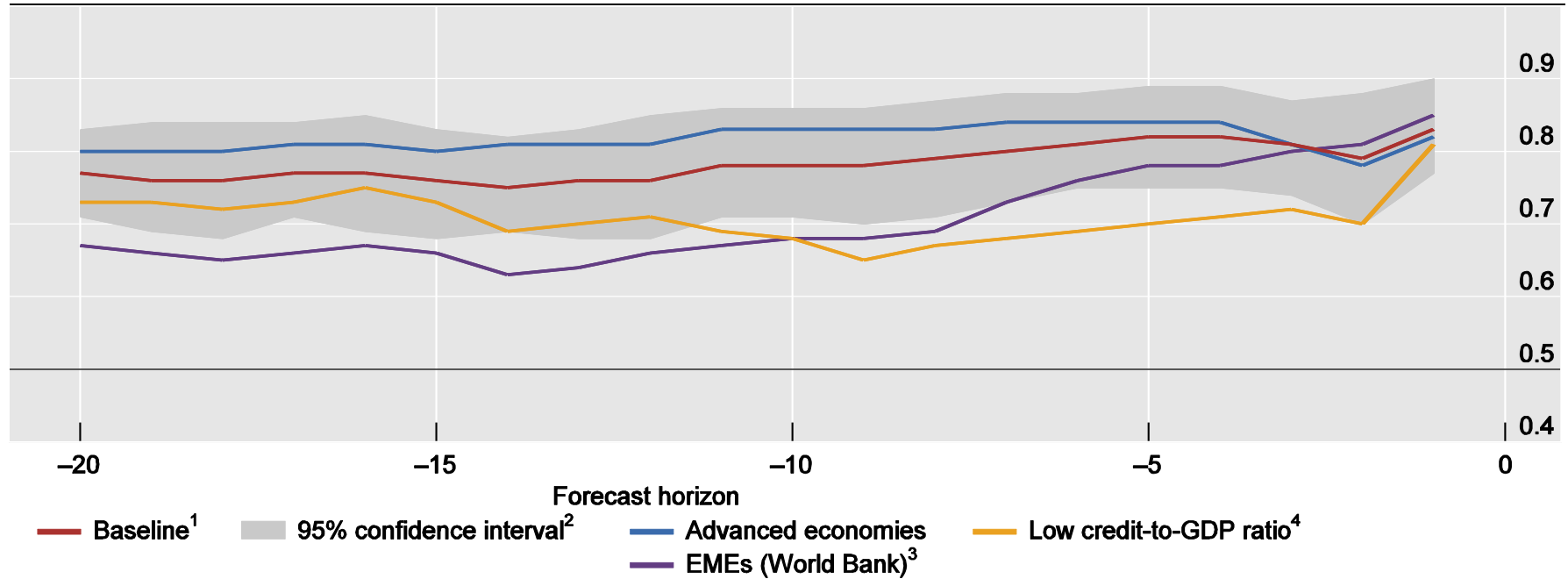
Is the credit-to-GDP gap a good indicator for EMEs?

- Critique 2: The use of the CTGG hinders financial deepening
 - If financial deepening occurs at a steady pace, gradual and persistent growth of credit will be embedded in the trend of the credit-to-GDP ratio.
 - Much of run-up in credit-to-GDP ratios in advanced economies can be explained by falling interest rates
- Critique 3: Analysis has been undertaken using mainly advanced economy data.
 - Correct, but the gap is statistically a very good indicator for EMEs.



The forecast performance of the credit-to-GDP gap for different samples

AUCs for different forecast horizons



The horizontal axis denotes the forecast horizons in quarters before crises. The vertical axis denotes the AUC. The horizontal line at 0.5 highlights the value of an uninformative indicator.

¹ As baseline, credit-to-GDP gaps are calculated by the standard methodology and the full sample of all countries is used. ² 95% confidence interval for the AUC using the baseline model. ³ EMEs according to World Bank classification. ⁴ Countries with a credit-to-GDP ratio below 100%.



Measurement problems with the CTGG

- Does the trend change when new data becomes available?
 - By design not
 - Using a 2-sided filter not possible for policy makers and gives worse EWI results
- There is a “start point” problem
 - An analysis shows that at least 10 years of data for the credit-to-GDP ratio are needed, before trend calculations become stable
- The gap can also be influenced by structural breaks
 - Common problem for macro series



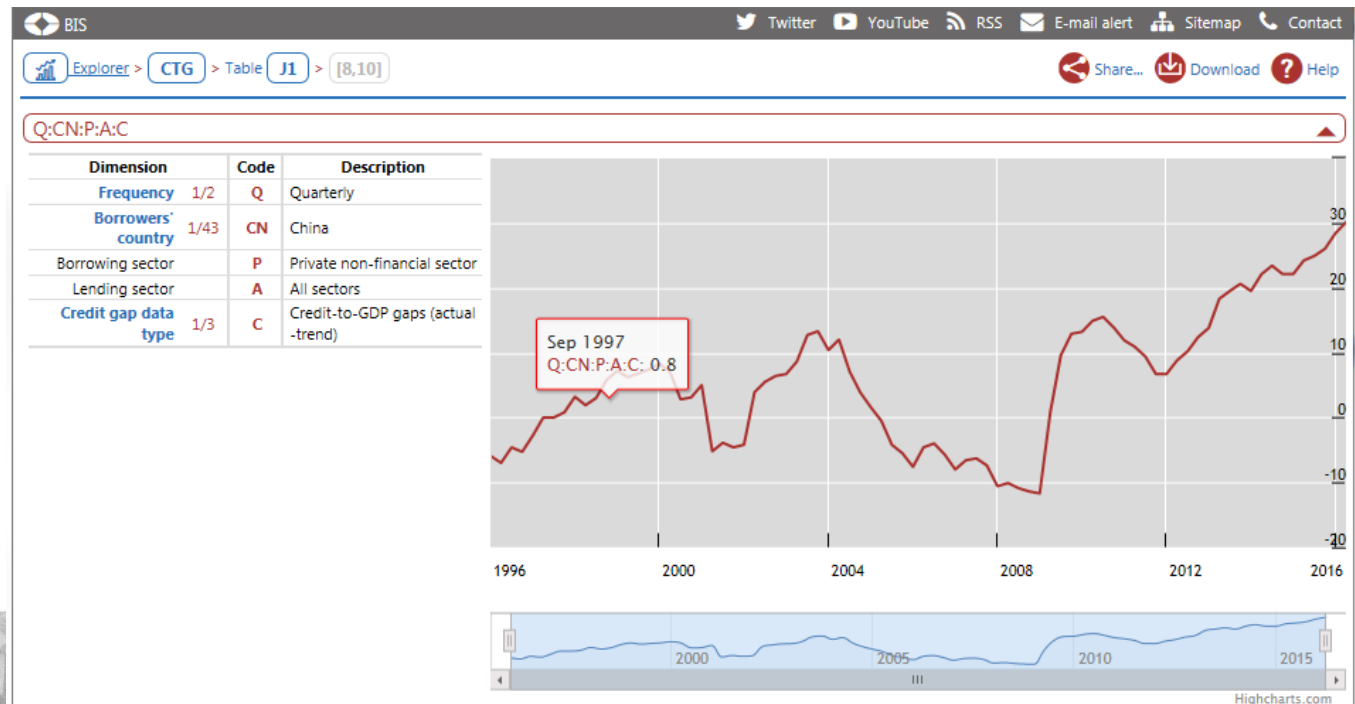
CTGG and bank capital buffer

- CTGG is used to determine the countercyclical capital buffer (CCB) by the Basel Committee
- Macroprudential goal of CCB:
 - protecting the banking sector from periods of excess aggregate credit growth
 - ensuring that the banking sector in aggregate has the capital on hand to help maintain the flow of credit in the economy without its solvency being questioned, when the broader financial system experiences stress
- Capital is built-up to protect the banking sector from effects of the financial cycle



New database on CTGG

- 43 countries
- Starting at the earliest in 1961
- On the BIS website
 - http://www.bis.org/statistics/c_gaps.htm?m=6%7C347



Thanks

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