# Systemically Important Banks and Capital Regulation Challenges

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**SYSTEMICALLY IMPORTANT BANKS AND CAPITAL REGULATIONS CHALLENGES**

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# SUMMARY/RÉSUMÉ

## Systemically Important Banks and Capital Regulation Challenges

Bank regulation might have contributed to or even reinforced adverse systemic shocks that materialised during the financial crisis. Capital regulation based on risk-weighted assets encourages innovation designed to circumvent regulatory requirements and shifts banks' focus away from their core economic functions. Tighter capital requirements based on risk-weighted assets may further contribute to these skewed incentives. The estimated macroeconomic costs of redirecting banks' attention away from such unconventional business practices are low. During a medium-term adjustment period, for each percentage point of bank equity, regulation that is not based on risk-weighted assets would affect annual GDP growth by -0.02 percentage point more than under the risk-weighted assets framework. Refocusing banks' attention toward their main economic functions is a core requirement for durable financial stability and sustainable economic growth.

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## Banques d'importance systémique: défis pour la réglementation du capital

La réglementation bancaire pourrait avoir contribué, voire renforcé, des chocs systémiques qui se sont matérialisés lors de la crise financière. La réglementation des fonds propres fondée sur des actifs pondérés par les risques encourage l'innovation conçue pour contourner les exigences réglementaires et éloigne les préoccupations des banques de leurs principales fonctions économiques. Le resserrement des exigences en capital fondées sur les actifs pondérés du risque peut exacerber ce biais d'incitation. Des estimations suggèrent que rediriger l'activité des banques hors de telles pratiques commerciales non-conventionnelles ne serait guère coûteux. Pendant une période d'ajustement de moyen terme, pour chaque point de pourcentage du ratio de capitaux propres bancaires, une réglementation qui ne s'appuie pas sur les actifs pondérés du risque réduirait la croissance annuelle du PIB de seulement 0,02 point de pourcentage de plus qu'une réglementation fondée sur les actifs pondérés par les risques. Un recentrage de l'attention des banques vers leurs principales fonctions économiques est une exigence fondamentale pour garantir la stabilité financière et une croissance économique durables.

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# SYSTEMICALLY IMPORTANT BANKS AND CAPITAL REGULATION CHALLENGES

by

Patrick Slovik[1]

1.	The simultaneous failure of markets and regulators to discipline systemically important banks before the financial crisis resulted in significantly negative consequences for economic output and government expenditures. This study discusses aspects of the failure of bank regulation and market discipline. Section I provides a perspective on the unintended consequences of bank regulation and argues that capital regulation might have contributed to or even reinforced adverse systemic shocks that materialised during the financial crisis. Section II discusses the conflict between the original role of banks in the economic system, which is to evaluate and provide loans to credit-worthy borrowers, and the decline in the profitability of this activity relative to other sources of bank income. The study finds, in Section III, that the economic costs of redirecting bank attention away from unconventional business practices are low. Section IV examines the relationship between the level of systemic importance of banks and their leverage. Financial market policy considerations and conclusions are drawn in Section V.

## I.	Unintended consequence of risk-weighted assets

2.	Systemically important banks have consistently decreased the base for the calculation of their regulatory capital. When the first Basel accord was implemented in 1992, risk-weighted assets represented close to 70% of bank total assets, which means that bank regulatory capital was calculated based on a large share of bank total exposures. In the years following the introduction of the Basel accord, the ratio of risk-weighted assets to total assets (RWA/TA ratio) gradually decreased and reached about 35% in the immediate pre-crisis period (Figure 1), which means that the regulatory capital of systemically important banks was calculated based on only a small fraction of their total exposures. The significant drop in the risk-weighted assets ratio implies that either (a) the exposures of systemically important banks were in the immediate pre-crisis period only half as risky as during the previous decade or (b) the regulatory framework based on risk-weighted assets omitted a huge proportion of the actual risk exposures of systemically important banks. Given the unprecedented scale of the financial crisis, the latter alternative is far more likely.

**Figure 1. Historical development of the RWA/TA ratio of systemically important banks**

3.        As Figure 1 demonstrates, the drop in the RWA/TA ratio has been very smooth since the implementation of the Basel accords without any significant deviations from the trend line until the crisis. This trend suggests that innovative engineering of regulatory risks and the move to unconventional business practices by systemically important banks has been a consistent trend for almost two decades and was not limited to a few years preceding the financial crisis. The trend reached its lowest point at the onset of the financial crisis when the capital requirements of systemically important banks were determined based on the historically lowest amounts of risk-weighted assets (relative to total assets). Risk-weighted regulation leads to unintended consequences as it encourages innovation designed to bypass the regulatory regime rather than to serve non-financial enterprises and households. Strengthening capital requirements based on risk-weighted assets may further contribute to these skewed incentives and their profitability. Appendix 1 provides more information on the construction of Figure 1 and additional statistics on systemically important banks.

## II. Bank lending and economic activity

4.        A core function of banks is to actively search for and evaluate lending opportunities and advance loans to credit-worthy enterprises and households. In the past, such activities accounted for the major share of large banks' assets. However, this share has declined substantially over time. Table 1 depicts the historical development of the ratio of total loans to total assets for selected large banks in the United States, the United Kingdom, Germany, France, and Switzerland. As the table shows, the loan portfolio represented around 75% of total assets of these banks in the early 1990s. Thereafter, the ratio of loans to total assets gradually declined to a low of around 30% in the immediate pre-crisis period. One of the main reasons why non-loan-related activities have become so important for banks is the relatively high regulatory risk-weights on loans relative to other types of assets, which puts them at a comparative disadvantage in the profit-seeking strategies of banks. In effect, capital regulation based on risk-weights creates incentives for banks to focus on non-lending activities.

**Table 1. Total loans to total assets: A historical perspective for selected banks (percentages)**

|  | 1990 | 1995 | 2000 | 2005 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|
| Deutsche Bank | 85 | 73 | 53 | 17 | 11 | 15 | 21 | 27 |
| UBS | 78 | 61 | 26 | 15 | 18 | 21 | 27 | 22 |
| BNP Paribas | 77 | 73 | 37 | 28 | 31 | 28 | 36 | 38 |
| Barclays | 78 | 68 | 64 | 33 | 32 | 25 | 34 | 32 |
| Bank of America | 58 | 62 | 61 | 44 | 51 | 51 | 40 | 42 |

*Source*:    Thomson Reuters Datastream, Author's calculations and estimates.

5.        Even during the boom in mortgage lending, prior to the financial crisis, banks at the centre of the crisis lacked strong incentives to devote adequate attention to due diligence of individual mortgage loans because their main profit margins were derived from securitisation of loans rather than from a prudent credit-risk assessment of individual loans. A major focus of systemically important banks has been to maximise profits by engineering unconventional assets, rather than making sure that each loan individually is worth the credit risk. Risk-weighted regulation shifts banks' attention and resources away from conventional lending. In contrast, regulation based on non-risk-weighted total assets places the same emphasis on loans as on other bank assets. In a framework where all assets bear the same regulatory cost, non-lending activities with the sole aim of exploiting or circumventing risk-weights would become unprofitable.

## III. Medium-term macroeconomic costs

6.        A commonly held view against regulation based on non-risk-weighted total assets (such as a leverage ratio) is that it would negatively affect the overall economy as banks would pass along a rise in their funding cost to their customers by increasing lending spreads. Table 2 compares the impact on bank lending spreads of a one percentage point increase in the ratio of equity to risk-weighted assets versus a one percentage point increase in the ratio of equity to total assets. For a one percentage point increase in equity requirements, a non-risk-weighted regulatory framework is estimated to increase lending spreads on average by 7.2 basis points (0.072 percentage point) more than in the case of risk-weighted regulation. This difference in the impact on bank lending spreads is estimated based on accounting identities applied to aggregated bank balance sheets. The reader can find a detailed description of the estimation method in Appendix 2.

**Table 2. Effects of higher capital requirements on bank lending spreads (basis points)**

**Impact of a 1 percentage point increase in equity to total assets vs. equity to risk-weighted assets**

|  | Δ Bank Lending Spreads (Equity to Total Assets) | Δ Bank Lending Spreads (Equity to Risk-Weighted Assets) | Difference |
|---|---|---|---|
| United States | 26.8 | 20.5 | 6.3 |
| Euro area | 26.5 | 14.3 | 12.2 |
| Japan | 11.6 | 8.4 | 3.2 |
| Average (unweighted) | 21.6 | 14.4 | 7.2 |
| Average (GDP weighted) | 24.3 | 16.1 | 8.2 |

*Source:*    Author's calculations and estimates.

7.      The medium-term macroeconomic impact is illustrated in Table 3, which shows the differences in the impact on annual GDP growth of an increase in the ratio of bank equity to risk-weighted assets and equity to total assets. For a one percentage point increase in the equity ratio, a non-risk-weighted regulatory framework would reduce medium-term annual GDP growth on average by only 0.02 percentage point more than risk-weighted regulation.[2] This impact on economic activity is estimated based on changes in bank lending rates shown in Table 2 above and the macro-economic impact coefficients during a five-year adjustment period estimated by Slovik and Cournède (2011).[3] The estimated effect is larger, though still small, in the euro area mainly due to (i) a greater share of bank credit intermediation in total credit intermediation in the euro area economy and (ii) a larger impact on bank lending spreads resulting from differences in accounting standards.[4]

**Table 3. Medium-term impact of higher capital requirements on annual GDP growth (percentage points)**

**Impact of a 1 percentage point increase in equity to total assets vs. equity to risk-weighted assets**

|  | Δ GDP Growth (Equity to Total Assets) | Δ GDP Growth (Equity to Risk-Weighted Assets) | Difference |
|---|---|---|---|
| **United States** | -0.05 | -0.04 | -0.01 |
| **Euro area** | -0.11 | -0.06 | -0.05 |
| **Japan** | -0.03 | -0.02 | -0.01 |
| **Average (unweighted)** | -0.06 | -0.04 | -0.02 |
| **Average (GDP weighted)** | -0.07 | -0.04 | -0.03 |

*Source*:      Author's calculations and estimates.

8.      The estimated differences in Tables 2 and 3 can be considered as conservative and in practice could be even lower. First, a one percentage point increase in the ratio of equity to total assets represents a higher increase in loss-absorption capacity than a one percentage point increase in the ratio of equity to risk-weighted assets; a higher loss-absorption capacity in turn implies a safer banking system, which would reduce bank borrowing costs and thus imply a smaller increase in bank lending rates. Second, the differences in the estimated impact reflect the assumption of no active response from monetary policy; a larger impact on bank lending spreads would in practice lead to a stronger monetary policy response and thus cushion the impact on economic activity. Third, if unconventional bank activities were to become less profitable, banks would presumably redirect their resources (including high-quality human capital) to conventional bank activities, implying better credit-risk assessments and more efficient financial intermediation.

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2 .      The medium-term macroeconomic impact shown in Table 3 represents an average impact on annual growth during a five-year adjustment period; beyond the medium term, annual GDP growth will revert to trend.

3 .      For more details on the macroeconomic impact coefficients see Appendix 3.

4 .      The IFRS accounting standard used in the euro area disallows netting of derivatives, which leads to a higher measure of total assets and thereby a larger macroeconomic impact compared to the GAAP accounting standard used in the United States. Looking further ahead, a convergence of standards across jurisdictions will lead to a convergence of the macroeconomic impact measures.

## IV. Systemic importance and market discipline

9.      Market forces should, in principle, correct for regulatory imperfections and prevent banks from taking excessive risks. However, the greater the systemic importance of a bank, the higher is the chance that it will be rescued by either the central bank or the government to prevent negative system-wide consequences. In view of such implicit guarantees, markets often fail to discipline large banks to hold prudent capital levels and make sound investment decisions. To illustrate this point, Figure 3 compares the systemic importance of a bank in its home jurisdiction with its leverage. Systemic importance of a bank (x axis) is defined as total assets of the largest bank in the country to gross domestic product (GDP). The leverage ratio (y axis) is calculated as total assets of the bank to its Tier 1 capital. The data in Figure 3 reveal that across OECD countries the bank leverage ratio is strongly correlated with the measure of bank systemic importance. The only notable outlier, on the high end of the 33 observations, is Germany with the leverage ratio of its largest bank the highest in the sample.

**Figure 2. Systemic importance and leverage ratio of the largest bank (end-2009)**
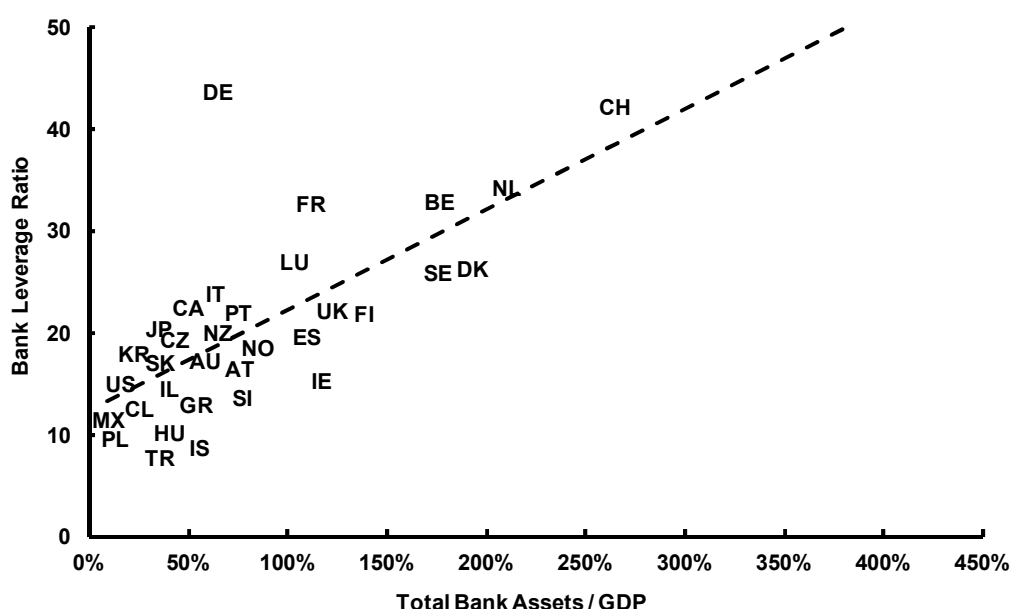


Note:       The correlation between the 32 observations (excl. Germany) and a linear trend line is 71%. Including the observation for Germany, the correlation between the 33 observations for all OECD countries and a linear trend line amounts to 53%.

*Source*:       The Banker Database, Author's calculations and estimates.

10.      The failure of markets to discipline systemically important banks has amplified existing regulatory imperfections. In contrast, in the run up to the crisis, the majority of small and medium-sized banks did not take on excessive leverage or engage in unconventional business practices, because their shareholders and creditors did not permit it. Bank regulation is not sufficient on its own and the lack of market discipline creates scope for financial instability. Without sufficient market discipline, capital surcharges for systemically important banks based on risk-weighted assets might only create stronger incentives to circumvent regulatory costs. Therefore, it could be more suitable to base additional capital requirements for systemically important banks on a non-risk-weighted framework.

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## V. Conclusions

11.     The anticipated benefits of a new regulatory regime often tend to be significantly overstated[5] because they are net of any unintended consequences, which are naturally not reflected in historical experience and time-series and therefore impossible to estimate. When the Basel accord first introduced the calculation of regulatory capital requirements based on risk-weighted assets, it was not expected that for systemically important banks the share of risk-weighted assets in total assets would consequently drop from 70% to 35%. Nor was it expected at the time that the financial system would transform high-risk subprime loans into seemingly low-risk securities on a scale that would spark a global financial crisis. Given the enormous scale of the experienced adverse systemic shock, rational policymakers should be cautious in estimating benefits of a new regulatory regime based on either econometric models or expert judgment. Tighter capital requirements based on risk-weighted assets aim to increase the loss-absorption capacity of the banking system, but also increase the incentives of banks to bypass the regulatory framework. New liquidity regulation, notwithstanding its good intentions, is another likely candidate to increase bank incentives to exploit regulation.

12.     Bank regulation cannot impose financial stability unilaterally without the market playing an active role in enforcing bank discipline. The main source of the failure of markets to discipline systemically important banks is that investors and creditors consider the risks of their losses implicitly guaranteed in the current state of affairs. Increasing the capacity of markets to discipline banks will require addressing the too-big-to-fail problem, strengthening and rationalising bank resolution regimes, and improving bank information disclosures. The Basel accords provide an internationally comparable and standardised set of rudimentary best practices in bank regulation, but they can only perform well in synergy with the market. The introduction of a leverage ratio based on non-risk-weighted total assets would help to align banks' activities with their main economic functions and maximise capital-allocation efficiency. Although a common argument against a stringent leverage ratio is that it would increase bank lending cost and negatively affect the economy, this study has shown that the differences between the macroeconomic impact of risk-weighted and non-risk-weighted regulatory regimes are relatively low.

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5 .        See also Suttle (2011).

**APPENDIX 1. HISTORICAL DATA ON SYSTEMICALLY IMPORTANT BANKS**

The statistics referenced in Section I of this study are calculated as a weighted average for 15 of the largest systemically important banks[6] in the United States, the euro area, the United Kingdom, and Switzerland. This set of banks comprises UBS, Barclays, BNP Paribas, Citigroup, HSBC, Credit Agricole, Royal Bank of Scotland, Deutsche Bank, Bank of America, ABN AMRO, Societe Generale, ING Bank, Banco Santander, UniCredit, and Credit Suisse. Table A depicts the main historical data for this group of banks: (a) the ratio of risk-weighted assets to total assets (RWA/TA), (b) the leverage ratio calculated as total assets to Tier 1 capital, and (c) the Tier 1 ratio calculated as Tier 1 capital to risk-weighted assets.

**Table A. Historical data on systemically important banks**

|      | RWA/TA | Leverage Ratio | Tier 1 Ratio |
|------|--------|----------------|--------------|
| 1991 | 66%    | 23             | 7%           |
| 1992 | 64%    | 24             | 6%           |
| 1993 | 65%    | 22             | 7%           |
| 1994 | 66%    | 21             | 7%           |
| 1995 | 63%    | 21             | 7%           |
| 1996 | 60%    | 23             | 7%           |
| 1997 | 53%    | 24             | 8%           |
| 1998 | 54%    | 23             | 8%           |
| 1999 | 51%    | 24             | 8%           |
| 2000 | 50%    | 25             | 8%           |
| 2001 | 48%    | 25             | 8%           |
| 2002 | 47%    | 25             | 9%           |
| 2003 | 44%    | 26             | 9%           |
| 2004 | 43%    | 28             | 8%           |
| 2005 | 40%    | 30             | 8%           |
| 2006 | 39%    | 31             | 8%           |
| 2007 | 37%    | 35             | 8%           |
| 2008 | 33%    | 33             | 9%           |
| 2009 | 37%    | 24             | 11%          |
| 2010 | 35%    | 24             | 12%          |

*Source:* The Banker Database, Author's calculations and estimates.

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6 .     The sample of the banks is determined based on their size in 2006, which is the year immediately preceding the financial crisis.

**APPENDIX 2. IMPACT ON BANK LENDING RATES**

The impact of Basel III on bank lending spreads in Section III is estimated based on accounting identities applied to aggregated banking sector balance sheets. For the purpose of the estimation, two categories of bank assets are considered: (i) Bank lending assets (AL) that comprise bank credit to households and non-financial corporations held on banking books, and (ii) Other bank assets (AO), which represent a residual category that comprises assets held on trading books, interbank assets, government bonds and other remaining assets. It is assumed that a bank can directly affect the pricing of AL by adjusting its lending spread. The pricing of AO is mainly market driven and it is therefore assumed that a bank cannot directly affect the pricing of these assets. The balance-sheet identity presented in Equation (1) postulates that the return on bank assets is equal to bank funding costs, which are determined by the cost of liabilities and the cost of equity. Equation (2) incorporates a one percentage point increase in bank capital relative to risk-weighted assets. Equation (3) incorporates a one percentage point increase in bank capital relative to total assets. An increase in bank capital will affect bank liability and equity structures and as a consequence the overall bank funding cost. To compensate for the change in funding cost, banks are assumed to adjust their lending spreads, while their costs of equity and debt financing are assumed to remain constant. Combining equations (1) and (2) leads to Equation (4), which shows the increase in bank lending spreads as a result of a one percentage point increase in the ratio of bank capital to risk-weighted assets. Combining equations (1) and (3) leads to Equation (5), which shows the increase in bank lending spreads as a result of a one percentage point increase in the ratio of bank capital to total assets. The data utilised in these estimations that feed into the medium-term macroeconomic impact assessment in Section III, represent an average of the last three pre-crisis years (2004-2006) calculated based on aggregated bank balance sheets and are shown in Table B.

$$r_t^{AL} \times AL + r_t^{AO} \times AO = r_t^L \times L + r_t^E \times E \tag{1}$$

$$r_{t+1}^{AL} \times AL + r_t^{AO} \times AO = r_t^L \times \left(L - \frac{RWA}{100}\right) + r_t^E \times \left(E + \frac{RWA}{100}\right) \tag{2}$$

$$r_{t+1}^{AL} \times AL + r_t^{AO} \times AO = r_t^L \times \left(L - \frac{1}{100}\right) + r_t^E \times \left(E + \frac{1}{100}\right) \tag{3}$$

$$(r_{t+1}^{AL} - r_t^{AL}) = \frac{(r_t^E - r_t^L)}{AL} \times \frac{RWA}{100} \tag{4}$$

$$(r_{t+1}^{AL} - r_t^{AL}) = \frac{(r_t^E - r_t^L)}{AL} \times \frac{1}{100} \tag{5}$$

Legend:

AL - Lending Assets to Total Assets (%)  
AO - Other Assets to Total Assets (%)  
L - Liabilities to Total Assets (%)  
E - Equity to Total Assets (%)  
RWA - Risk-weighted Assets to Total Assets (%)  

$r_t^{AL}$- Return on Lending Assets (%)  
$r_t^{AO}$ - Return on Other Assets (%)  
$r_t^L$- Cost of Borrowing (%)  
$r_t^E$- Cost of Equity (%)

**Table B. Historical data based on aggregated bank balance sheets (percentages)**

|  | $r_t^E - r_t^L$ | AL | RWA |
|---|---|---|---|
| United States | 12.7 | 47.5 | 76.4 |
| Euro area | 9.4 | 35.4 | 53.9 |
| Japan | 7.7 | 66.0 | 72.0 |

Note: The data represent an average of the last three pre-crisis years (2004-2006) calculated based on aggregated bank balance sheets.

*Source*: IIF (2010), Slovik and Cournède (2011), Author's calculations and estimates.

# APPENDIX 3. MACROECONOMIC IMPACT COEFFICIENTS

The macroeconomic impact coefficients utilised in Section III are based on an earlier study by the author[7] and are summarised in Table C and Table D.

**Table C. Macroeconomic impact of a 100 basis point increase in bank lending rates**

|  | GDP level (percentages) | | | | | GDP growth (percentage points) |
|---|---|---|---|---|---|---|
|  | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | annual |
| **United States** | -0.08 | -0.31 | -0.54 | -0.77 | -0.93 | -0.18 |
| **Euro area** | 0.00 | -0.23 | -0.93 | -1.40 | -2.10 | -0.42 |
| **Japan** | 0.00 | -0.33 | -0.50 | -1.17 | -1.33 | -0.27 |
| **Average (simple)** | -0.03 | -0.29 | -0.66 | -1.11 | -1.45 | -0.29 |
| **Average (GDP weighted)** | -0.03 | -0.28 | -0.69 | -1.08 | -1.45 | -0.29 |

*Source*:     Slovik and Cournède (2011).

**Table D. Macroeconomic impact of a one percentage point increase in bank capital ratios**

|  | GDP level (percentages) | | | | | GDP growth (percentage points) |
|---|---|---|---|---|---|---|
|  | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | annual |
| **United States** | -0.02 | -0.06 | -0.11 | -0.16 | -0.19 | -0.04 |
| **Euro area** | 0.00 | -0.03 | -0.13 | -0.20 | -0.30 | -0.06 |
| **Japan** | 0.00 | -0.03 | -0.04 | -0.10 | -0.11 | -0.02 |
| **Average (simple)** | -0.01 | -0.04 | -0.10 | -0.15 | -0.20 | -0.04 |
| **Average (GDP weighted)** | -0.01 | -0.05 | -0.11 | -0.17 | -0.22 | -0.04 |

*Source*:     Slovik and Cournède (2011).

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7.        Slovik and Cournède (2011).

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