

## Box A

# European Bank Stress Tests

Stress tests are a common risk management tool used by financial institutions. Prudential supervisors also use stress tests to assess vulnerabilities facing individual financial institutions and financial systems as a whole. These tests typically involve specifying a scenario in which economic and financial variables shift adversely, and then estimating the impact on financial institutions' asset portfolios and capital, as well as other key metrics. The results allow supervisors to identify potential weaknesses and risks in financial institutions, which can then prompt corrective actions.<sup>1</sup> The global financial crisis has significantly increased the focus on stress testing given the strained conditions in many advanced country banking systems.

Like most prudential supervisory activity, the results of stress tests for individual financial institutions are usually kept confidential. This allows supervisors to probe vulnerabilities among financial institutions using more severe scenarios without creating unnecessary public concern about unlikely events. Since the beginning of the financial crisis, however, supervisors in some jurisdictions have chosen to publish the results for individual institutions from industry-wide stress tests – for example, US supervisors released stress test results for 19 large US banking groups in May 2009. Publication has been aimed at reducing uncertainty about the soundness of individual banks, and thus improving market confidence in the broader banking system. It can also be designed to provide authorities with the legitimacy to address weak institutions. In these cases, the stressed or adverse scenario is generally

constructed to be less unlikely than in unpublished tests, and the baseline scenario often already involves some degree of stress.

The large banks in the European Union (EU) were subjected to a stress test in 2010, and again earlier this year, and the individual results of both were published. The 2010 stress test was co-ordinated by the Committee of European Banking Supervisors (CEBS), an advisory body comprising representatives from the various national supervisory agencies. The publication of the results from this stress test in July 2010 initially helped to calm market sentiment about the health of European banking systems and their resilience to sovereign debt problems, which had intensified earlier that year. But a few aspects of the methodology for the 2010 stress test were criticised by some commentators. First, a sovereign default was not incorporated in the scenario despite growing market concerns at the time about sovereign debt sustainability for a few euro area countries. While sovereign debt exposures in the participating banks' trading books were required to be marked down, the much larger sovereign exposures in their banking books were not stressed. Second, the capital benchmark chosen – a 6 per cent Tier 1 capital ratio – was inconsistently defined by national supervisors and deemed too easy to pass. Indeed, two Irish banks that met the capital benchmark under the adverse scenario were later found to require significant additional capital, the majority of which has since been provided by the Irish Government.

To alleviate continuing market concerns about the health of European banking systems, a second EU-wide bank stress test was conducted earlier this year by the European Banking Authority (EBA), the

<sup>1</sup> A discussion of the different types of stress testing used by financial institutions and supervisors can be found in APRA (2010), 'Stress-testing for authorised deposit-taking institutions', *APRA Insight*, Issue 2, pp 2–12.

successor to the CEBS. The 2011 stress test was applied to 91 institutions, representing about 65 per cent of EU banking sector assets and a minimum of 50 per cent of bank assets in each of the 21 participating countries.<sup>2</sup> The Spanish central bank, which is also the bank supervisor, took the approach of requiring almost all of its domestic banks to participate in the test.

The stress test required banks to estimate their credit impairments, trading losses and capital position, under both a baseline and an adverse scenario for 2011 and 2012. A number of aspects of this stress test were toughened compared with the previous test.

- The adverse economic scenarios were more severe relative to the baseline scenarios and more differentiated across countries. For example, annual EU GDP growth under the adverse scenario was 4 percentage points below the baseline in the 2011 test, compared with 3 percentage points below for the 2010 test.
- Banks were this time required to provision for losses on their banking book sovereign exposures based on assumed credit rating downgrades for sovereigns rated below AAA as at 1 June 2011 (two notches for sovereigns rated AA to A- and four notches for sovereigns rated BBB+ or below). Sovereign exposures were also assumed to have a 40 per cent loss given default.
- A funding cost shock was introduced. Banks' funding costs were increased in line with assumed sovereign spreads (to the German sovereign). It was assumed that at least one-half of the increase in funding costs could not be recovered from customers and therefore flowed directly through to profits and capital.
- A 5 per cent core Tier 1 ratio was consistently adopted as the capital benchmark. This is a stricter definition of capital than the 2010 Tier 1 definition because it excludes capital with lower loss absorbency, including most hybrid instruments.

<sup>2</sup> Includes one bank from Norway, which is not part of the EU.

The stress test found that, under the adverse scenario, the aggregate core Tier 1 capital ratio of the participating banks would fall to 7.7 per cent at the end of 2012, down from 8.9 per cent at the end of 2010; it would reach 9.8 per cent under the baseline scenario. Most banks were found to exceed the capital benchmark under the adverse scenario, although the results were quite dispersed (Graph A1). Eight relatively small banks (five from Spain, two from Greece and one from Austria) failed to meet the benchmark 5 per cent core Tier 1 capital ratio.<sup>3</sup> The EBA recommended that national supervisory authorities require these banks to present plans for remedial actions within three months and take action on these plans by end 2011. The relevant national supervisory authorities stated publicly at the time that these banks would have passed the stress test if capital measures announced or planned after the EBA's end-April deadline were included and capital measures not recognised by the EBA (such as general provisions) had been eligible.

A further 16 banks were estimated to have core Tier 1 capital ratios of between 5 and 6 per cent under the adverse scenario. The EBA recommended that supervisors request banks that had ratios above but close to 5 per cent take steps to strengthen their capital positions if they have sizeable exposures to the sovereigns under most stress.

The decline in banks' core Tier 1 capital ratios under the adverse scenario largely reflected estimated losses on their credit exposures. Credit impairments reduced the aggregate core Tier 1 capital ratio of the participating banks by 3.7 percentage points, compared with a 0.5 percentage point reduction from trading book losses and a 1.1 percentage point decline due to higher risk-weighted assets. These effects were partly offset by increases in

<sup>3</sup> One German landesbank that would have also failed the stress test pulled out of the test late in the process after deals to convert local government silent participations – a form of hybrid capital – into approved core capital were deemed ineligible by the EBA. The results presented here therefore cover only 90 banks.

**Graph A1**  
**Banks' Core Tier 1 Capital Ratio Under**  
**Adverse Scenario\***

As at 31 December 2012



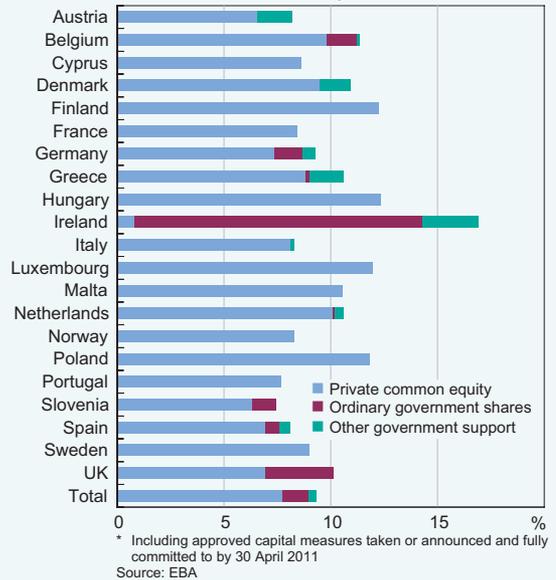
banks' underlying profits, which were estimated to contribute about 3.7 percentage points to the aggregate capital ratio under the adverse scenario.

Estimated credit impairments were particularly large for some Irish and Greek banks, in part reflecting tougher economic and property market assumptions applied to these banks. Greek banks were also most affected by impairments on sovereign debt given the already low credit rating on Greek debt as at 1 June.

The participating banks' starting capital ratios were supported by recent capital raisings. In total, €50 billion in approved capital measures were undertaken or confirmed in the first four months of 2011, adding 0.4 percentage points to the aggregate core Tier 1 capital ratio. One-third of this capital was from government sources. As at end April 2011, 38 participating banks had received public capital support. Public capital accounted for an estimated 17 per cent of all participating banks' aggregate core

**Graph A2**  
**Components of Banks' Core Tier 1 Capital Ratio\***

As at 30 April 2011



Tier 1 capital, including capital measures that had been confirmed but not yet implemented at this time (Graph A2). Around three-quarters of this public capital support was through ordinary shares and the rest from other eligible instruments (for example, preferred shares). The extent of government support varied significantly across countries: there was no support in a number of countries (such as France and Sweden), while there was significant support in others (such as Germany and the United Kingdom). In Ireland, the large domestic banks are almost entirely owned by the Irish Government.

In conjunction with publishing the results of the stress test, the EBA also disclosed detailed information on participating banks' sovereign and other exposures to individual EU countries in order to enhance market transparency. The data on sovereign exposures were more extensive than the previous year in that they were broken down by maturity and included details on exposures arising from derivative positions. Participating banks

together held about €1.8 trillion in EU government debt at the end of 2010 (net of cash short positions), equivalent to 16 per cent of their risk-weighted assets, and a little under one-fifth of total EU general government debt outstanding (Table A1). On average, exposures to home-country sovereign

debt represented about 60 per cent of participating banks' EU sovereign exposures. Their largest foreign EU sovereign exposures were to Germany and Italy, reflecting the sizeable amount of sovereign debt these countries have on issue.

**Table A1: EU Banks' Net Sovereign Debt Exposures<sup>(a) (b)</sup>**  
As at 31 December 2010, € billion

	Country of debt issuance					Memo item: Domestic
	Greece Portugal and Ireland	Italy	Spain	Other EU <sup>(c)</sup>	Total EU <sup>(c)</sup>	
<b>Sovereign debt held by banks in:</b>						
Austria	0.6	1.2	0.2	43.3	<b>45.3</b>	13.9
Belgium	6.3	20.6	2.9	70.8	<b>100.5</b>	26.3
Cyprus	6.2	0.0	0.1	2.2	<b>8.5</b>	1.4
Denmark	0.5	0.4	0.1	13.6	<b>14.7</b>	5.7
Finland	0.0	–	0.0	0.9	<b>1.0</b>	0.4
France	15.0	41.1	9.3	199.2	<b>264.5</b>	102.5
Germany	12.0	32.9	17.1	363.8	<b>425.8</b>	305.5
Greece	48.4	0.1	–	3.6	<b>52.1</b>	48.4
Hungary	–	–	–	4.7	<b>4.7</b>	4.3
Ireland	10.4	0.8	0.3	5.3	<b>17.0</b>	10.2
Italy	1.9	159.0	3.0	38.4	<b>202.2</b>	159.0
Luxembourg	0.3	2.4	0.2	3.4	<b>6.2</b>	2.9
Malta	0.0	0.0	–	0.8	<b>0.8</b>	0.7
Netherlands	2.4	8.2	2.1	115.9	<b>128.6</b>	44.0
Norway	–	–	–	14.9	<b>14.9</b>	14.3
Poland	–	–	–	6.6	<b>6.6</b>	6.6
Portugal	20.9	1.0	0.3	1.9	<b>24.0</b>	18.9
Slovenia	0.1	0.1	0.0	2.6	<b>2.7</b>	1.4
Spain	6.0	6.6	222.3	9.6	<b>244.4</b>	222.3
Sweden	0.3	0.4	0.2	86.7	<b>87.5</b>	25.2
UK	4.8	11.5	6.6	164.6	<b>187.5</b>	91.3
<b>Total</b>	<b>136.1</b>	<b>286.3</b>	<b>264.4</b>	<b>1 153.0</b>	<b>1 839.7</b>	<b>1 105.2</b>
<b>Memo item:</b>						
<b>General government debt outstanding</b>	<b>637.1</b>	<b>1 843.0</b>	<b>638.8</b>	<b>6 852.7</b>	<b>9 971.7</b>	

(a) Gross long exposures (net of cash short positions)

(b) Of participating banks in EU stress test only

(c) Includes Norway

Sources: EBA; European Commission; RBA