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# DYNAMIC PROVISIONING: RATIONALE, FUNCTIONING, AND PRUDENTIAL TREATMENT

by Marco Burroni, Mario Quagliariello, Emiliano Sabatini and Vincenzo Tola*

**Abstract**

Current policy debate has renewed interest in countercyclical provisioning policies; dynamic provisions are regarded as a valuable device for pursuing this goal. Last July, Ecofin supported "the introduction of forward-looking provisioning, which consists in constituting provisions deducted from profits in good times for expected losses on loan portfolios, and which would contribute to limiting procyclicality". This paper describes: i) how dynamic provisions work in a general framework based on expected losses; ii) how they work according to the Spanish system, which is the only real example of countercyclical provisioning; iii) the differences and similarities between the expected loss model and the Spanish approach. Building on proposals currently under discussion in the international community, it also suggests a possible way forward for introducing a system of dynamic provisions that, while meeting the prudential goal of having more conservative provisioning policies, would not clash with accounting standards.

**JEL Classification**: G21, G28.
**Keywords**: dynamic provisions, capital buffers, Basel 2, credit risk, procyclicality.

**Contents**



* Bank of Italy, Banking and Financial Supervision.

## 1. Introduction[1]

The possible role of loan loss provisions for capital and earnings management has been widely discussed both in the theoretical and empirical literature (Ahmed et al., 1999). According to Fudenberg and Tirole (1995), income smoothing through provisioning policies is the consequence of three drivers. First, managers derive a non-monetary private benefit from running the firm; second, poor performance provokes the intervention of shareholders, leading to managers' dismissal; third, recent profits carry more weight than past profits when the performance of managers is assessed. In this framework, managers tend to save current income in good times by making higher provisions since they are not worried about being dismissed. By contrast, in bad times, they tend to boost reported profits by depleting accumulated provisions.

This behaviour is frequently considered as an obstacle to financial statements' transparency and market discipline; fiscal authorities are also suspicious when income-smoothing strategies are adopted by firms. This holds for non-financial firms as well as for banks. In fact, in many countries, accounting standards, fiscal rules and supervisory guidelines limit the possibility for banks to smooth the income through discretionary provisioning policies. In the US, for instance, after an intense debate on whether discretion over provisioning policies was beneficial or detrimental to sound banking, the Securities and Exchange Commission and four supervisory agencies issued a joint statement (Federal Reserve Release, November 24, 1998) mentioning that "although management's process for determining loan loss allowance is judgmental and results in a range of estimated loss, it must not be used to manipulate earnings or mislead investors".

An unintended result of such a framework is that banks' provisions are cyclical. In fact, starting with Cavallo and Majnoni (2002), increasing empirical evidence has shown that banks' loan-loss provisions follow the cycle: most banks tend to underestimate risk in good times and systematically under provision; in subsequent bad times, losses emerge and deplete profits and, possibly, capital. They analyse the policies of large commercial banks in various countries in order to see whether intermediaries use provisions for smoothing their income, which is considered an indicator of wise provisioning policies. They find that bankers, on average, smooth their income, but they do not create sufficient provisions in good (macroeconomic) times. The negative relationship between provisions and loan/GDP growth suggests that banks provision during and not before recessions, thus magnifying the effects of the downturns. Similar evidence is reported by the European Central Bank (2001) for a sample of EU banks.

[1] We wish to thank C. Calandrini, F. Cannata, A. Cinque, P. Corradino, A. Enria, A. Generale, U. Proia, A. Renzi, A. Resti, K. Ryan and L. F. Signorini for their comments. We are very grateful to colleagues at the Banco de España, particularly to J. Saurina, J. Serrano and C. Trucharte, for their generous help and invaluable advice. A final thank goes to Jennifer Parkinson for her final revision of the paper. Remaining errors are obviously our own responsibility. The opinions expressed are those of the authors and do not necessarily reflect those of the Bank of Italy.

A slightly different piece of evidence is provided by Bikker and Hu (2002), who estimate an unbalanced fixed-effect panel model and evaluate the procyclicality of banks' provisions for a sample of 26 OECD countries between 1979 and 1999. They find that the coefficients of GDP growth and inflation show a negative sign; however, in years of higher net interest income the amount of provisions is greater, thus supporting the income-smoothing hypothesis. Therefore, the authors claim that, even if provisions go down in favourable (macroeconomic) times, banks tend to reserve more in good years (i.e. when profits are higher); as a result, banks are less procyclical than it would appear just looking at their dependence on the business cycle. This may be due to some misalignment among business and credit cycles.

Valckx (2003) considers the loan loss provisioning policy of EU banks using a sample of 15 European banking systems between 1979 and 2001. According to his results, loan loss provisions are determined by GDP growth, interest rates and some bank specific indicators both at sector level and for individual banks. The positive relationship between income margin and provisions suggests that the income-smoothing hypothesis for EU banks applies, thus contradicting the ECB's findings.

Also country-specific studies confirm these findings. Pain (2003) uses a small panel dataset covering the period 1978-2000 and shows that provisions exhibit some cyclical dependence; among the various indicators he considers, GDP growth, real interest rates and lagged aggregate lending seem to be the most significant macroeconomic drivers of provisioning. Not surprisingly, he also finds that bank specific factors are relevant: lending to riskier sectors is generally associated with higher provisions; in particular, mortgage banks provision less than commercial banks since their loans are typically collateralized. Arpa et al. (2001), estimating a distributed lag model covering the period between 1990 and 1999, conclude that provisions increase in a period of falling real GDP growth, confirming the procyclicality of bank behaviour; however, consistently with the income-smoothing hypothesis, they also find some evidence that provisions are higher in times of rising bank profitability. Analogous evidence is provided by Quagliariello (2007) for Italian banks.

Current policy debate has renewed the interest for countercyclical (or, at least, less cyclical) provisioning policies; dynamic provisions are regarded as a valuable device for pursuing this goal. In fact, last July, Ecofin (2009) supported "the introduction of forward looking provisioning, which consists in constituting provisions deducted from profits in good times for expected losses on loan portfolios, and which would contribute to limiting pro-cyclicality". In connection with the revision of the Capital Requirements Directive, the European Commission (2009) has very recently issued a consultation paper aiming at introducing dynamic provisions in Europe.

While the most widely discussed mechanism for implementing dynamic provisioning is to align provisions to expected losses, the only concrete example of dynamic provisions – the Spanish system – is based upon a different approach. However, analysing the different proposals in greater depth, it is clear that the divergence is mainly lexical; in fact, the

philosophy underlying most of them is to require banks to provision for future losses that may emerge from events that have not yet materialized but are expected to produce losses over the term of the loan.[2] In practice, the easiest way to do this is to look at the past experience of losses over an entire business cycle. In this respect, the definition of expected losses is closer to the collective impairment assessment provided for by IAS 39 than to the concepts used in the Basel 2 prudential framework. This is also the definition we use throughout the paper.

This paper describes: i) how dynamic provisions work in a general framework based on expected losses; ii) how they work under the Spanish rules; iii) the differences and similarities between the expected loss model and the Spanish approach. Building on proposals currently under discussion in the international community, it also suggests a possible way forward for introducing a system of dynamic provisions that, while meeting the prudential goal of having more conservative provisioning policies, would not clash with accounting standards.

## 2. The expected loss model for dynamic provisions

Accounting treatment of provisions (currently based on the IAS/IFRS principle of incurred losses) can create distortions in measuring banks' profits: in good times, when incurred losses are generally lower, profits are large, while large losses are recorded in recession (see Annex 1). If profits are not sufficient to cover loan losses in downturns, these distortions also affect capital levels and, therefore, banks' ability (or willingness) to supply adequate flows of lending to the real economy.

Since banks' policy and pricing strategies take into account that a proportion of borrowers may not be able to pay their loans back, it is natural to think of a system of dynamic provisions based on the concept of expected loss. Indeed, "the fundamental principle underpinning dynamic provisioning is that provisions are set against loans outstanding […] in line with an estimate of long-run expected loss" (Mann and Michael, 2002).

Under such a system, in good times, incurred losses are lower than long-term expected losses, the flow of specific provisions in the accounting period is less than expected and banks accumulate resources (the stock of dynamic provisions increases); in bad times, by contrast, the flow of specific provisions is higher than the expected losses and the shortfall is deducted from the stock of dynamic provisions built up in upturns. Net profits are not affected and no cyclical effect materializes.

An example may help us to understand how this mechanism would work. Table 1 shows a simplified Balance Sheet and Income Statement where the stock of loans increases by 100 currency units each year and net interest income is 16 per cent of total loans. For simplicity, we assume that the flow of new loans and interest income are not affected by the business cycle. While unrealistic, this hypothesis allows us to focus on the mechanics of dynamic

[2] A different approach, based on the estimation of the expected cash flows of a loan at inception, is proposed by the IASB (2009). While this paper does not focus on such a proposal, a brief description and a preliminary discussion are provided in Annex 2.

provisions, under a *ceteris paribus* assumption. We also assume that bad loans are never written off the balance sheet.

**Table 1 - Incurred loss accounting**

| | Year t (good) | Year t+1 (good) | Year t+2 (bad) | Year t+3 (neutral) | Year t+4 (good) |
|---|---|---|---|---|---|
| **Balance Sheet** | | | | | |
| Loans (L, nominal value) | 100 | 200 | 300 | 400 | 500 |
| Flow of loans | 100 | 100 | 100 | 100 | 100 |
| Stock of specific provisions | 0 | 0 | 47 | 62 | 75 |
| Loans net of provisions | 100 | 200 | 253 | 338 | 425 |
| **Income statement** | | | | | |
| Net interest income | 16 | 32 | 48 | 64 | 80 |
| Specific provisions (s, incurred losses) | 0 | 0 | 47 | 15 | 13 |
| Profits | 16 | 32 | 1 | 49 | 67 |

Since banks adopt an incurred loss approach, they do not provision against future losses already embedded in their loan portfolio - rather they raise specific provisions only when losses actually occur. In good times (t, t+1), they do not record any losses and, therefore, do not make any provisions at all. The stock of provisions is not built up until it is too late (t+2), thus significantly affecting profits when things go very wrong.[3]

Starting from the same Balance Sheet and Income Statement, Table 2 shows how a dynamic provisioning system would work. Banks provisions against expected losses – over a one-year horizon – arising from the flow of new loans:

$$\textbf{Dynamic provisions} = \alpha \Delta L - s,$$

where $\alpha$ is the average long-run expected losses, $\Delta L$ is the flow of new loans and s the flow of specific provisions. Each year, the flow of total provisions is the sum of dynamic and specific provisions, i.e. $\alpha \Delta L$, regardless of the cyclical conditions.

*As we mentioned above, while the expected loss model is based on concepts that recall the Basel 2 framework, they do not match the IRB measures, which are point-in-time (not long-term averages) and forward-looking. In the IRB approach, the expected losses are based on current PDs and (downturn) LGDs, while the expected losses used for dynamic provisioning are long-term averages of losses recorded in the past. The two definitions tend to be closer when banks adopt through-the-cycle rating systems, which is not necessarily the case. It is also worth highlighting that the IRB definition of expected loss is the one to be used for determining the eligibility of general provisions in supervisory capital.*

[3] In the paper, we have good years when incurred losses are lower than expected losses, bad years when incurred losses are higher than expected losses and neutral years when incurred and expected losses are equal.

**Table 2 - Dynamic provisioning based on expected losses**

| | Year t (good) | Year t+1 (good) | Year t+2 (bad) | Year t+3 (neutral) | Year t+4 (good) |
|---|---|---|---|---|---|
| **Balance Sheet** | | | | | |
| Loans (L, nominal value) | 100 | 200 | 300 | 400 | 500 |
| Flow of loans | 100 | 100 | 100 | 100 | 100 |
| Stock of specific provisions | 0 | 0 | 47 | 62 | 75 |
| Stock of dynamic provisions | 15 | 30 | -2 | -2 | 0 |
| Stock of total provisions | 15 | 30 | 45 | 60 | 75 |
| Loans net of provisions | 85 | 170 | 285 | 340 | 423 |
| **Income statement** | | | | | |
| Net interest income | 16 | 32 | 48 | 64 | 80 |
| Specific provisions (s, incurred losses) | 0 | 0 | 47 | 15 | 13 |
| $\alpha\Delta L$ | 15 | 15 | 15 | 15 | 15 |
| Dynamic provisions ($\alpha\Delta L$-s) | 15 | 15 | -30 | 0 | 2 |
| Extra losses | 0 | 0 | -2 | 0 | 0 |
| Profits | 1 | 17 | 31 | 49 | 65 |

Since we assumed a constant flow of loans (100 currency units) each year and a 15 per cent expected loss ($\alpha$), the flow of total provisions is 15 currency units per year, regardless of cyclical conditions. At t and t+1, expected losses are higher than incurred losses (which are actually equal to zero) and they contribute to increasing the stock of dynamic provisions to be used in bad times. At time t+2, the boom period is over, incurred losses increase markedly, but can, to a large extent, be covered by the stock of dynamic provisions, which is run down. It is worth pointing out that, by construction, the stock of dynamic provisions can never exceed the stock of expected loss; the stock of total provisions is constantly equal to the stock of expected loss (more precisely, to the expected loss of the stock of loans).

In the example, the stock of dynamic provisions built up in good times is not sufficient to cover the whole amount of losses at t+2 and profits are affected (-2).[4] This clearly depends on the pattern and timing of booms/recessions. Indeed, the amount of dynamic provisions that has been built up will depend upon the length of the positive phase of the business cycle. This issue would be particularly important for the first time application (since dynamic provisions have to be accumulated ahead of the downturn, they should be introduced in recovery periods).

The example shows how a simple dynamic provisioning system may work. However, it also makes it clear that this approach only allows for a relatively slow accumulation of resources (in fact, at time t+2, when the crisis materializes, the stock of provisions reveals itself to be inadequate). In addition, assume that loans continue to grow by 100 currency units per year after t+4: the banks will restart provisioning 15 per year. In terms of stocks, dynamic provisions will appear very small compared to the size of the loans (e.g. 15 against 600 at

[4] For simplicity, we allow the stock of dynamic provisions to fall below zero at t+2 and t+3.

t+5). This is consistent with the fact that expected losses related to a loan portfolio at t+4 have already materialized and this part of the portfolio only bears unexpected losses. However, it would be difficult to make this distinction n a real balance sheet.

The final issue relates to the accounting treatment of dynamic provisions. We assumed that provisions are deducted from reported profits (thus, they contribute to smoothing them), while in principle one may conceive a similar mechanism founded on prudential reserves, which would imply the accumulation of resources through profit distribution (thus, not affecting reported profits). We will discuss this issue in section 5.

## 3. The Spanish system

### *3.1 The model*

The expected loss model may be used to limit the impact of loss cyclicality on banks' profits by aligning provisions to long-term expected losses. However, it only allows for a relatively slow accumulation of resources in good times; its effectiveness is therefore very much dependent on the pattern of the business cycle.

Therefore, more conservative (and thus, more countercyclical) provisioning approaches may be deemed more adequate. This is the philosophy behind the system established by the Banco de España.

The Spanish system for dynamic provisioning is not based on an expected loss model, but rather on banks' loan loss experience. In this respect, it uses a backward-looking model: it analyses historical information to set an adequate level of dynamic provisions.

While in principle banks may be authorized by the Banco de España to use their own data and models, no bank has been allowed to do that so far.[5] Therefore, this section discusses the model for dynamic provisioning provided by the Banco de España to banks, calibrated with information from the Spanish Central Credit Register.

Each year, banks are required to charge their Income Statement with: i) the flow of specific provisions (s) to cover incurred losses, ii) the flow of general provisions (g), based on historical credit loss information. Specific provisions are a percentage ($\gamma$) of the flow of non-performing loans ($\Delta P$) that emerged in a given year $\rightarrow s = \gamma \Delta P$. Parameter $\gamma$ is determined by each bank since it reflects losses actually incurred.

General provisions are calculated according to the following formula:

$$\mathbf{g = max\ [0, (\alpha \Delta L + \beta L - s)],}$$

where $\alpha$ is the average estimate of the credit losses; $\Delta L$ is the change in total loans; $\beta$ is the historical average of specific provisions; and L is the stock of total loans. Both parameters are estimated for six different risk classes (ranging from negligible risk to high risk):

[5] Paragraph 13, Annex IX, of Circular 4/2004 states the criteria for applying internal models.

| Risk Class | α | β |
|---|---|---|
| Negligible risk | 0% | 0% |
| Low risk | 0.6% | 0.11% |
| Medium-low risk | 1.5% | 0.44% |
| Medium risk | 1.8% | 0.65% |
| Medium-high risk | 2.0% | 1.10% |
| High risk | 2.5% | 1.64% |

Source: Banco de España, Circular 4/2004, Annex IX.

*As already mentioned, the Spanish system is not (and is not intended to be) an expected loss model. However, neglecting differences in terminology, α may be interpreted – with some caution – as the expected loss arising from the flow of new loans (ΔL). In other words, the first component of Spanish dynamic provisions (αΔL) can easily be brought back to the expected loss model. The significant difference between the latter and the Spanish system is represented by the second component (βL – s), where β is estimated looking at the past flow of specific provisions for non-performing loans and is then adjusted and applied to the entire loan portfolio, and s is a flow figure referring to new non-performing assets. This component should be considered as a pragmatic device for building up and running down the stock of general provisions (see Jiménez and Saurina, 2006).*

By comparing βL with the current level of specific provisions, the bank can assess the speed at which incurred but not identified losses evolve into specific losses:

- in upturns, βL is higher than s, banks are under-pricing the actual risk they have in the portfolio (latent risk not captured by specific provisions);
- in downturns, βL is lower than s, banks are over-pricing the actual risk they have in the portfolio.

In upturns, s is lower than αΔL + βL and the flow of general provisions is positive; thus, the stock of general provisions (G) is built up. In symbols, when αΔL + βL > s,

$$\mathbf{g = \alpha\Delta L + \beta L - s}$$

and

$$\mathbf{Total\ provisions = g + s = \alpha\Delta L + \beta L - s + s = \alpha\Delta L + \beta L}$$

In downturns, s is higher than αΔL + βL, the flow of general provisions is set to zero and G is run down. Using the same notation, if αΔL + βL < s, then g = 0. Clearly, if G > s, the new G = G – s; if G < s, the new G goes to zero and banks record losses (s - G).

The Spanish rules also include upper and lower limits to the stock of general provisions. In particular, it is required to remain within the range: $0.33*\alpha L \leq G \leq 1.25*\alpha L$. The cap prevents the accumulation of disproportionately large resources with countercyclical purposes, the floor avoids such resources being entirely depleted.

*Both limits have been set by the Banco de España on the basis of historical data, which take into account the impact of past severe recessions. Provisions above the average annual historical experience of losses (αL) make the Spanish system more conservative than the expected loss model. It is worth pointing out that the lower bound has recently been reduced to 0.1 by the Banco de España in order to provide banks with extra resources for dealing with the financial crisis.*
*When G is higher than αL, the additional amount of provisions accumulated in G are able to cover "extraordinarily" high expected losses (up to 0.25*αL), which should probably be defined as unexpected losses. Therefore, in our view, this fraction of G is more similar to capital buffers than to provisions. It is also worth recalling that in the expected loss model described in the previous section, the stock of general provisions cannot rise above the stock of expected loss.*

Table 3 shows the relationships among the different parameters throughout the business cycle.

**Table 3 - Behaviour of parameters during the lending cycle**

| Lending Cycle | ΔNPL | s | αΔL | βL – s | Latent risk | g | G | Comments |
|---|---|---|---|---|---|---|---|---|
| Upturn | ↓ | ↓ | ↑ | > 0 | ↑ | > 0 | ↑ (up to the limit 1.25 αL) | Banks build up the Fund |
| Downturn | ↑ | ↑ | ↓ | < 0 | 0 | = 0 | ↓ (up to the limit 0.33 αL) | Banks run down the Fund |

### *3.2 An example: how the Spanish system works in practice*

The following example shows how the Spanish system would work in practice. In order to make the example realistic, we made the following assumptions:

- credit growth (ΔL) is cyclical, but it is always positive.[6] In particular, we assumed that $\Delta L/L = \eta * |\sin(k*t)|$, where η = 2,70%; k = 30%; t=1, 2, 3, …, 50.[7]
- The non-performing loans value (NPL) is also consistent with the presence of a credit cycle: therefore when credit growth increases, ΔNPL decreases following ΔNPL/L = [max (ΔL/L) - ΔL/L].
- Parameters α and β are those provided by the Banco de España for medium risk portfolios (α = 1,8% β = 0,65%); we set the percentage of specific provisions (γ) at 45%.

Table 4 shows how the components of general provisions would behave. From the above assumptions it follows that in economic downturns, the (βL – s) factor is the only one responsible for reduction of the stock of provisions. Indeed, during bad times the stock of provisions related to the αΔL term still tends to grow, but at decreasing rates. In other words, the αΔL term is only able to generate an increase of the stock of provisions during good

[6] The initial credit level has been set at 100.

[7] The η parameter governs the width of the cycle, while the k parameter drives its frequency.

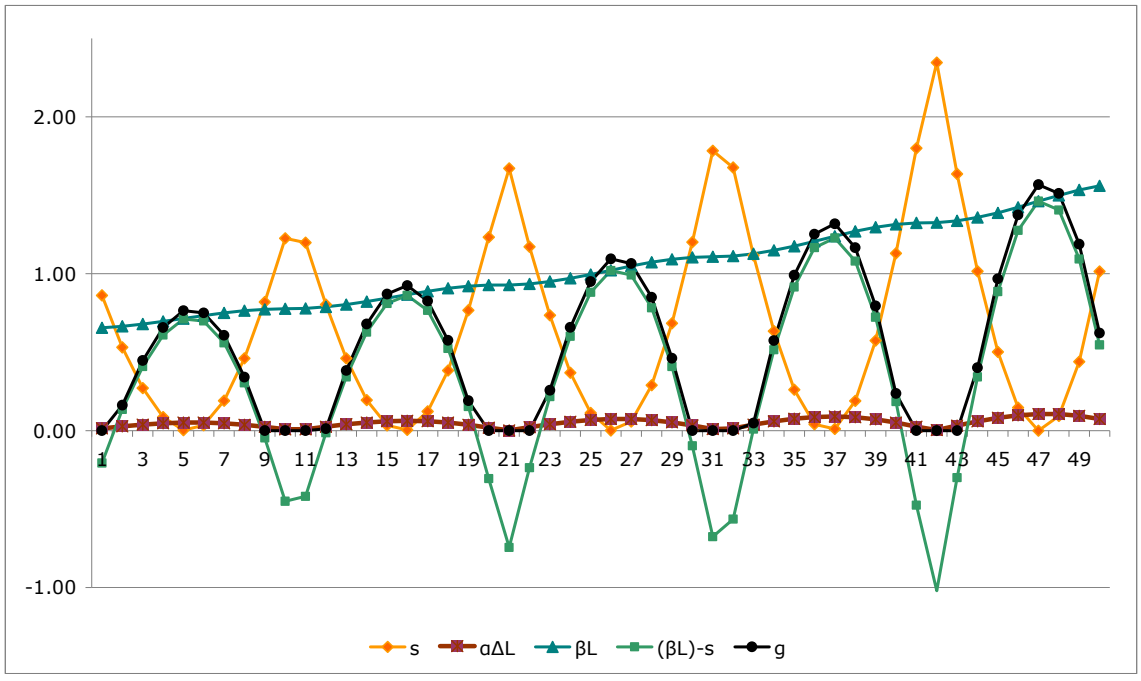
times, but is not able to reduce it during recessions. Therefore, during economic downturns, the provisions related to unspecific risk do not produce to a countercyclical effect.[8]

**Table 4 - Components of Spanish dynamic provisions over a hypothetical credit cycle. The first 10 observations of the example are reported**

| Year | ΔL/L | ΔNPL | αΔL | s | (βL–s) | g |
|---|---|---|---|---|---|---|
| 1 | 0.80% | 1.92 | 0.01 | 0.86 | -0.21 | - |
| 2 | 1.52% | 1.18 | 0.03 | 0.53 | 0.13 | 0.16 |
| 3 | 2.11% | 0.60 | 0.04 | 0.27 | 0.41 | 0.45 |
| 4 | 2.52% | 0.19 | 0.05 | 0.09 | 0.61 | 0.66 |
| 5 | 2.69% | 0.01 | 0.05 | 0.00 | 0.71 | 0.76 |
| 6 | 2.63% | 0.08 | 0.05 | 0.03 | 0.70 | 0.75 |
| 7 | 2.33% | 0.42 | 0.05 | 0.19 | 0.56 | 0.61 |
| 8 | 1.82% | 1.02 | 0.04 | 0.46 | 0.30 | 0.34 |
| 9 | 1.15% | 1.82 | 0.02 | 0.82 | -0.05 | - |
| 10 | 0.38% | 2.73 | 0.01 | 1.23 | -0.45 | - |

Figure 1 depicts the behaviour over time of the flow of specific and general provisions and their components. Specific provisions are, not surprisingly, highly cyclical. The introduction of dynamic provisions, which are by construction countercyclical, makes total provisions relatively stable over the cycle.

**Figure 1 - Components of the Spanish dynamic provisions over the cycle**



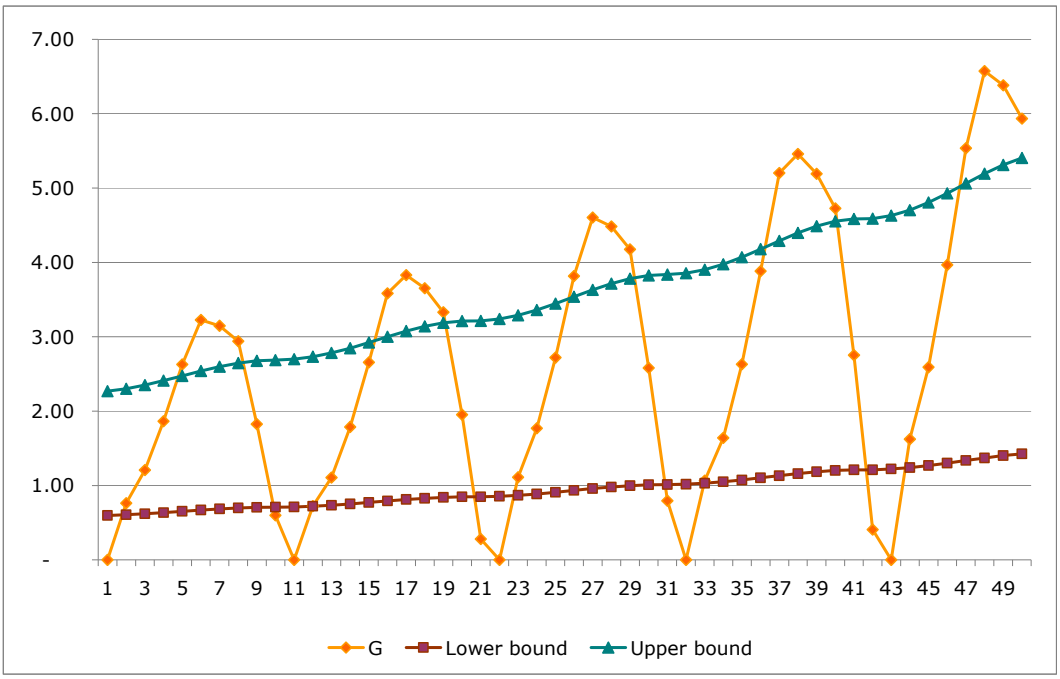

With respect to the expected loss model, the Spanish system allows for a higher and quicker accumulation of resources in good times, thanks to the term βL. As a matter of fact,

[8] It is worth noting that such provisions are common in standard provisioning systems.

when credit growth is higher, the latent risk, measured by the βL, exceeds the value of the specific provisions s, determining an increase in the stock of general provisions. The opposite occurs in downturns.

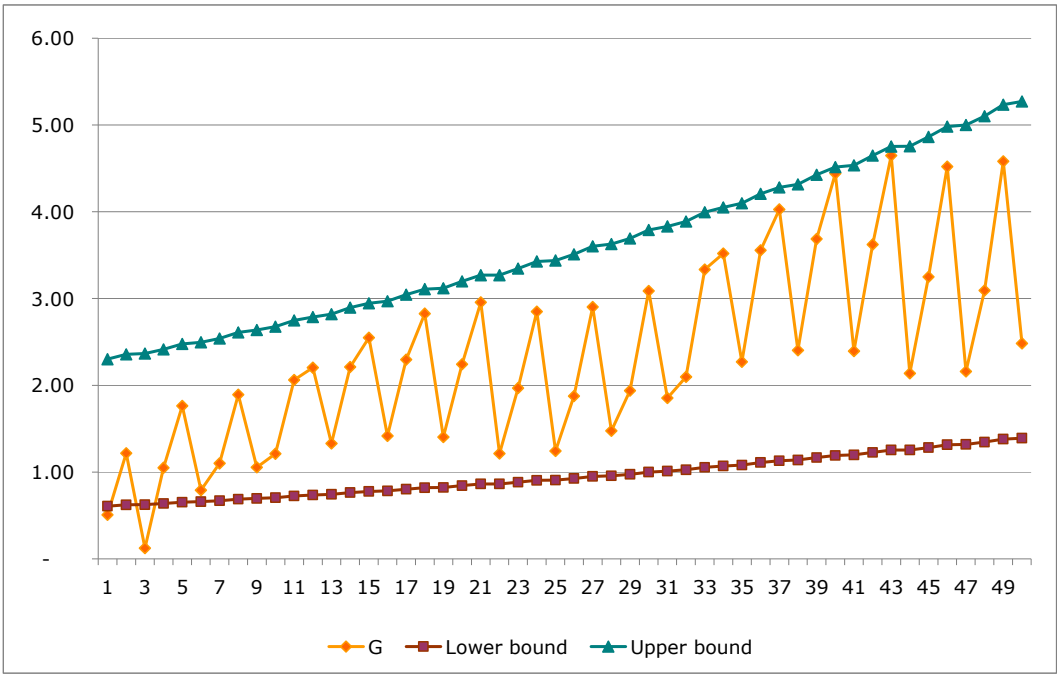
Figure 2 sketches the impact of this mechanism of accumulation/draining on the stock of provisions.

**Figure 2 - Dynamics of G and of its upper and lower bounds**




In our example, there are periods when either banks have to stop dynamic provisioning in booms because G has reached the upper bound or they have to provision more than αΔL + βL in recession because G is not sufficient. However, this is very much example-specific and depends, above all, on the length of the business cycle and, thus, on the characteristics of the simulated series of credit growth and non-performing loans. For example, in Figure 3 we show what would happen assuming a shorter business cycle (η = 2,70%; k = 100%). In this case, G is almost constantly within the upper and lower bounds.

**Figure 3 - Dynamics of G and of its upper and lower bounds –alternative scenario (η = 2,70%; k = 100%)**




### *3.3 Accounting, prudential and fiscal treatment*

From the accounting perspective, general provisions are set to cover "inherent" losses (i.e. losses already incurred, but that cannot be allocated to specific borrowers). Therefore, the Banco de España considers them an application – admittedly borderline – of IAS 39, which allows for "collective assessment for impairment".

*IAS 39 considers a loan impaired if, on the basis of objective evidence, it is partly or wholly uncollectible, so that its carrying amount is greater than its estimated recoverable amount. Objective evidence in this context includes: 1) significant financial difficulty of the issuer; 2) actual breach of contract; and 3) a high probability of bankruptcy. Another criterion is a historical pattern of collections of accounts receivable that indicates that the entire face amount of a portfolio of accounts receivable will not be collected (see Annex 1). The latter concept is close to that of expected loss.*
*As a consequence of the current debate, accounting standards may be revised to allow for a more widespread use of the long-term expected loss for provisioning purposes. Indeed, the G20 leaders called "the accounting standard setters to work urgently with supervisors and regulators to improve standards on valuation and provisioning and achieve a single set of high-quality global accounting standards". Accordingly, the Financial Stability Forum (2009) recommended "standards setters [to] reconsider their current loan loss provisioning requirements and related disclosures including by analysing fair value, expected loss and dynamic provisioning approaches". At this stage, it is difficult to forecast the outcome of this discussion, but more convergence between prudential and accounting requirements is advisable and would make the implementation of dynamic provisions easier.*

The following example shows the impact of Spanish dynamic provisioning on the Income Statement and Balance Sheet Statement, assuming that in an expansionary year (t) banks charge 50 currency units for specific provisions and 200 for general provisions ($\alpha\Delta L + \beta L = 250$) and that no provisions have been accumulated before t (G is equal to zero before t).

***Income Statement Year t***

| Expenses (Losses) | | Incomes (Profits) | |
|---|---|---|---|
| Impairment: | 250 | | |
| - specific | 50 | | |
| - general | 200 | | |
| | | Net loss | 250 |

***Balance Sheet Year t***

| Assets | | Liabilities and equity | |
|---|---|---|---|
| Loans (gross) | 1,400 | G | 200 |
| Specific provisions | (50) | Equity | 1,400 |
| Loans (net) | 1,350 | Net loss | (250) |
| Total assets | 1,350 | Liabilities and eq | 1,350 |

In recession (t+1), specific provisions charged to the Income Statement increase to 400, while total provisions do not change ($\alpha\Delta L + \beta L$ is still 250, i.e. we assume $\Delta L=0$). Therefore, the flow of general provisions is negative (-150) and G is run down. The outcome is shown below.

***Income Statement Year t+1***

| Expenses (Losses) | | Incomes (Profits) | |
|---|---|---|---|
| Impairment: | 400 | Reversal of impairment | 150 |
| - specific | 400 | - specific | 0 |
| - general | 0 | - general | 150 |
| | | Net loss | 250 |

***Balance Sheet Year t+1***

| Assets | | Liabilities and equity | |
|---|---|---|---|
| Loans (gross) | 1,400 | G | 50 |
| Specific provisions | (450) | Equity | 1,400 |
| Loans (net) | 950 | Retained earnings | (250) |
| | | Net loss | (250) |
| Total assets | 950 | Liabilities and eq. | 950 |

The treatment of the stock of general provisions G ("allowances for general credit loss provision") follows the Basel 2 principles for the eligibility of general provisions in the regulatory capital. Therefore, when G is above the expected loss, the excess can be computed as Tier 2 capital up to 0.6 per cent of credit and counterparty risk-weighted assets; when G is below the expected loss, 50 per cent of the shortfall is deducted from Tier 1 and 50 per cent from Tier 2.

*Our attempt to reconcile the Spanish system with the expected loss model is useful for understanding also how the former interacts with the Basel 2 framework. Let's define the IRB point-in-time expected loss as EL. According to Basel 2 rules:*
*If $EL<$Provisions (G) $\Rightarrow$ Excess to be computed*
*If $EL>$Provisions (G) $\Rightarrow$ Shortfall to be deducted*
*Therefore, the possibility of including dynamic provisions in the regulatory capital may reduce their countercyclical role. Indeed, while it is true that they reduce the fall of profits in recession, they may contribute to the depletion of capital should G drop below EL.*
*Assuming that in expansion: $EL<\alpha L<G \Rightarrow$ Excess=(G-EL), where $G-\alpha L$ is clearly a "buffer" against unexpected losses, while ($\alpha L$-EL) represents the difference between long-term and point-in-time expected losses.*
*In recession: $EL>\alpha L$, if $EL>G \Rightarrow$ shortfall to be deducted from Tier1/Tier2 $\Rightarrow$ capital is cyclical as a consequence of eligible dynamic provisions.*

*Against this background, should dynamic provisions be implemented in Europe, our proposal is that provisions above EL are not reckoned as supervisory capital for the purpose of meeting the Pillar 1 minimum, but (G-αL) may be used as Pillar 2 buffers. Also, (αL-EL) cannot be considered eligible since it covers losses already incurred but not yet identified.*[9]

From a fiscal perspective, the impairment for general credit loss provision is not deductible (a fiscal filter sterilizes its effect). In the example, losses for fiscal purposes are 50 currency units in year t and 400 in t+1 (rather than 250 in both years).

### *3.4 An example: the interaction between provisions and capital buffers*

Building on the example we presented in section 3.2, in this section we sketch how a system of dynamic provisions interacts with Pillar 2 capital buffers.

For this purpose, we have to introduce a simple mechanism for calculating a capital buffer. Thus we assume that banks' PDs are a 5 year average of the ratio of the flow of non-performing loans to the stock of performing loans (ΔNPL/L, which can be interpreted as a default rate). By construction, such PDs are relatively PiT, since they do not include a full business cycle. Therefore, banks have to build up buffers against capital requirement fluctuations (i.e. the fluctuations of unexpected losses). The easiest way for calculating the highest capital requirements banks would be expected to meet should the worst past recession materialize in the future is to compare the worst-case PD (in our example the highest PD over a 15 year time frame) and the current PD. The capital buffer (CB) would be the difference between the capital requirement computed using the downturn and the current PD respectively.

$$\mathbf{CB = K_{downturn} - K_{current}}$$

which decreases in a recession and increases in expansionary phases. For the calculation of K we use the regulatory formula for the corporate portfolio, with neither maturity nor sales adjustments; LGD is 45 per cent.

*The mechanism for determining the capital buffer used in this paper is a rough application of a proposal for countercyclical buffers currently being discussed at the Committee of European Banking Supervisors (CEBS, 2009). This proposal envisages a mechanism that takes into account the historical changes in PDs estimated by banks – the key and most cyclical driver of minimum capital requirements under the IRB approach – in order to build specific IRB buffers against recessionary conditions.*
*In practice, the mechanism is based on a quantitative assessment of the gap between current PDs and PDs corresponding to recessions (downturn PDs). In principle, the approach can be applied at different levels of aggregation. However, the less computationally burdensome approach works at the portfolio level (i.e. at the level of the different asset classes in banking books).*

[9] A more drastic option would be to exclude dynamic provisions from the regulatory calculation difference (i.e. they would not be taken into account when comparing IRB EL and provisions).

*The approach is straightforward. First, the PD of the portfolio at time t is calculated as the average of grade PDs weighted by the number of counterparties in each grade:*

$$\frac{\sum_{g=1}^{k} PD^{g} N^{g}}{\sum_{g=1}^{k} N^{g}}$$

*where $PD^g$ is the PD of each grade "g" (1, ... , k) and $N^g$ is the number of counterparties in grade "g". The PD of the portfolio would obviously change over the cycle as the result of two different factors:*

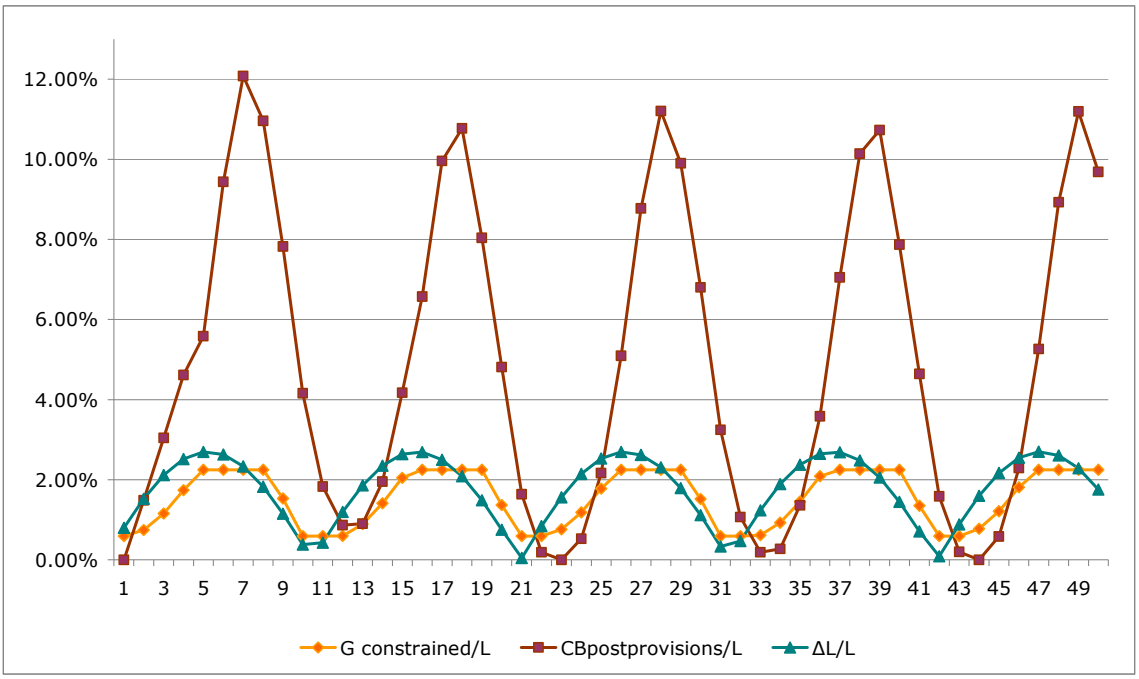
- *transition of borrowers across grades (which is more pronounced in more PiT rating systems);*
- *change of grade PD (which is more pronounced in more TTC rating systems).*

*This methodology therefore aims at ensuring that the countercyclical adjustments are neutral with respect to the philosophy of the rating methodology.*
*Then, a scaling factor for the entire portfolio can be computed as: $SF^p = PD_{downturn} / PD_{current}$ which is close to 1 in a recession and assumes values higher than 1 in expansionary phases. The final step is to adjust grade-PDs ($PD^g$) using the scaling $SF^p$ and compute the buffer as the difference between the regulatory capital requirements based on the adjusted PDs and those based on the unadjusted PDs.*

From the discussion above, we learnt that banks that follow dynamic provisioning rules already have a part of unexpected losses covered by the share of provisions exceeding long-term expected losses (G - αL). Therefore, according to our proposal, when G - αL is greater than 0, this component of the dynamic provisions should be deducted for the capital buffer: $CB_{postprovisions} = CB - (G - \alpha L)$. This implies that at the peak of expansion a bank could reach a maximum level of countercyclical resources (including both dynamic provisions and Pillar 2 capital buffers) equal to a $CB_{postprovisions} + G = CB + \alpha L$.

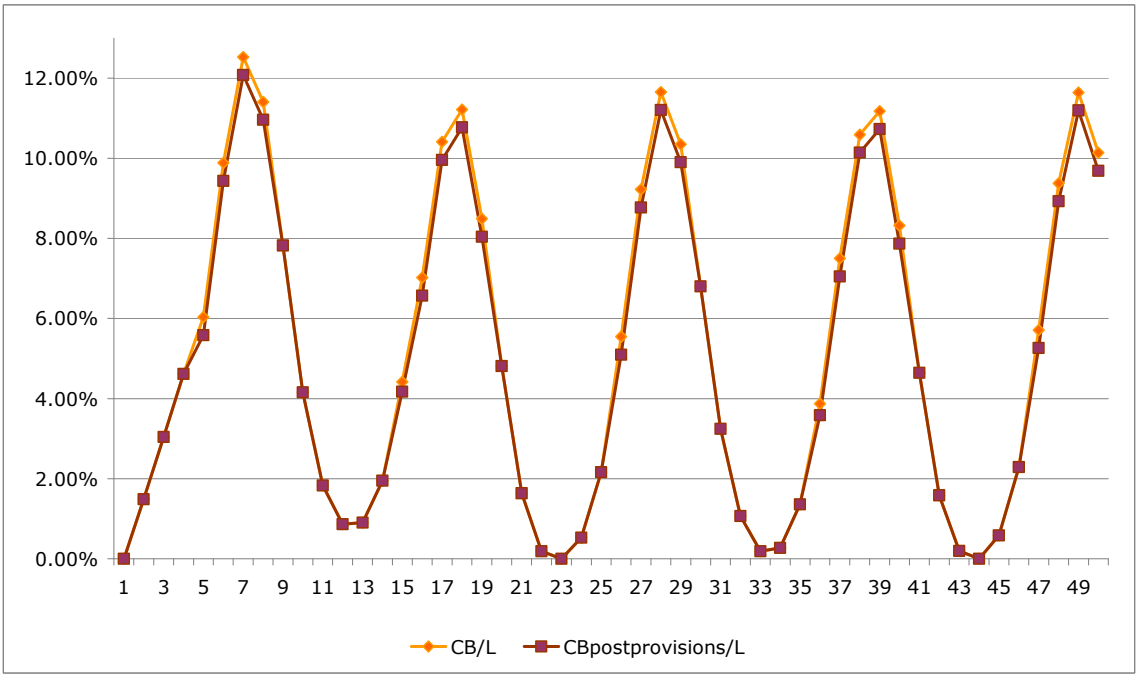
Figure 4 shows the dynamics of capital buffers and dynamic provisions as a percentage of total loans.

**Figure 4 - Dynamic of business cycle, capital buffer with provisions and G**




Finally, Fig. 5 depicts the difference between CB and $CB_{postprovisions}$. It is quite evident that, in absolute terms, the contribution to dynamic provisions above αL to capital buffers tends to be negligible, even though this is also linked to the simulation design.

**Figure 5** Dynamic of CB vs CBpostprovisions



## 4. The Turner Review proposal revisited

An alternative approach to the expected loss model and the Spanish system was proposed in the Turner Review (FSA, 2009a, 2009b). The proposal is labelled as an expected loss model, but in fact the flow of dynamic provisions is calculated using the stock of loans outstanding at the beginning of each year; therefore, there is no guarantee that provisions will be aligned to expected losses in terms of stock measures.[10] However, in order to avoid over-provisioning, the proposal envisages a cap on the total stock of provisions, based on a predetermined percentage of risk-weighted assets (in the range of 2-3 per cent, according to the FSA).[11] As in the Spanish system, backward-looking experience of losses is used for determining the expected loss rate and there is no reference to any forward-looking concept of expected losses.[12]

In our view, from a theoretical perspective this approach is less well-founded than that based on the flow of loans, since the stock of dynamic provisions tends to overshoot the expected loss of the loan portfolio. This is not a minor issue since, as already mentioned, accounting standard setters may be willing to accept the principle that provisions are based on long-term expected loss, but no more than that. On the other hand, working on stock measures allows for a quicker accumulation of resources, as witnessed by the Spanish experience. Therefore, we suggest a revision aiming at ensuring consistency between the stock provisions and expected loss at any point in time. In practice, we propose that the cap on the stock of dynamic provisions should be equal to the expected loss of banks' loan portfolios ($\alpha L$).

Using the same example we introduced in Section 2, Table 5 shows how this would work in practice.

**Table 5 – Dynamic Provisions in the Turner Review "revisited"**

| | Year t (good) | Year t+1 (good) | Year t+2 (bad) | Year t+3 (neutral) | Year t+4 (good) |
|---|---|---|---|---|---|
| **Balance Sheet** | | | | | |
| Loans (L, nominal value) | 100 | 200 | 300 | 400 | 500 |
| Flow of loans | 100 | 100 | 100 | 100 | 100 |
| Stock of specific provisions | 0 | 0 | 47 | 62 | 75 |
| Cap ($\alpha L$) on stock of dynamic provisions | 15 | 30 | 45 | 60 | 75 |
| Stock of dynamic provisions without cap | 15 | 45 | 43 | 88 | 150 |
| Stock of dynamic provisions with cap | 15 | 30 | 28 | 60 | 75 |
| Stock of total provisions | 15 | 30 | 75 | 122 | 150 |
| Loans net of provisions | 85 | 170 | 225 | 278 | 350 |

[10] Strictly speaking, the Turner Review proposes a system of prudential reserves rather than provisions. At this stage, we prefer to take up the discussion on the accounting treatment in the next section.

[11] More precisely, the Turner Review suggests a possible calibration for the total size of countercyclical buffering.

[12] However, according to the Turner Review, this would not prevent further discussion on the possibility of banks using IRB models to estimate expected losses.

| Income statement | | | | | |
|---|---|---|---|---|---|
| Net interest income | 16 | 32 | 48 | 64 | 80 |
| Specific provisions (s, incurred losses) | 0 | 0 | 47 | 15 | 13 |
| αL | 15 | 30 | 45 | 60 | 75 |
| Dynamic provisions (αL-s) without cap | 15 | 30 | -2 | 45 | 62 |
| Difference between stock and cap | 0 | 0 | -17 | 0 | 0 |
| Dynamic provisions (αL-s) with cap | 15 | 15 | -2 | 32 | 15 |
| Profits | 1 | 17 | 3 | 17 | 52 |

At any point in time, banks would be required to make provisions equal to the minimum between αL and the amount needed to have a stock of dynamic provisions equal to αL. Assuming that α is equal to 15 per cent, at t banks' provisions would be 15 currency units (the stock increases to 15). At time t+1, without a cap, banks should provision for 30, but since the stock of dynamic provisions is already at 15, they are required to provision only for 15: once the stock of provisions has reached the cap, the model based on the stock of loans behaves in exactly the same way as the one based on flows. In bad times, banks can use the accumulated provisions in order to cover higher than expected losses. Indeed, at time t+2, they can run down the stock by 2 currency units; the stock decreases to 28 currency units (while αL is 45). Incidentally, it should be remembered that under the model based on the flow of loans, provisions were not sufficient to cover losses at t+2. At time t+3, a neutral year, banks should provision for 45 without a cap, but they only need to provision for 32 in order to restore the stock of dynamic provisions.

An important drawback of this approach is that profits can be severely hit by the need to provision, particularly after a crisis, when they are unstable. Indeed, in our example, profits range from 1 to 52 depending on the level of resources banks have to devote to provisions. This is partly due to the design of our example, where incurred losses follow a very volatile pattern, which directly affects profits. However, this problem may also occur after severe crises that determine the running down of a large part of accumulated provisions. If banks were required to rebuild the stock of provisions immediately after the crisis, the recovery might be seriously slowed down. Therefore, one can envisage some mechanism (e.g. a cap on the flow of provisions calculated as a percentage of profits) in order to allow for a less abrupt re-accumulation process.

Lastly, we also want to emphasize that the choice of the cap on the stock of provisions is a delicate policy decision. We suggest using expected loss as a benchmark in order to maintain consistency between the expected loss model and an effective system of dynamic provisions. However, we acknowledge that supervisors may wish to adopt more conservative rules and, for instance, set the cap at higher levels, as in Spain. In our view, this is certainly feasible, but it would reduce the clarity of the system. As we have already mentioned, the share of provisions above αL would cover unexpected losses rather than expected losses, making it more similar to capital buffers. In addition, we doubt that accounting standard setters may

consider this component of provisions as consistent with IAS 39, even after its possible alignment to the expected loss model.

## 5. Provisions versus reserves

So far we have discussed the mechanisms for designing a system of dynamic provisions, implicitly assuming that they would directly impact reported profits. However, countercyclical resources can also be accumulated via prudential reserves, which would only affect distributable profits. In fact, the Turner Review proposes a system of prudential reserves (called economic cycles reserves).

As shown in the previous section, the introduction of dynamic provisioning implies charging additional provisions related to the lending activity to the income statement. In terms of the balance sheet, this implies booking a stock of provisions on the liability side or – and this is only a question of presentation – using the net approach on the asset side. The most important consequence is that there is a clear impact on reported profits (the so-called "bottom line" of the income statement or the "net income of the year").

Dynamic reserving works in a similar way, but at the level of distributable profits: reported profits (i.e. net income) would be higher than under provisions, but profit distribution would be limited by either a law or a regulation aiming at sterilizing part of the profits that, in fact, are not available for shareholders. Clearly this reserve should be recognized as a reserve of equity on the liability and equity side of the balance sheet.

The pros of provisions are very clear: first, their countercyclical potential is higher since reported profits are smoothed over time; second, the mechanism is very transparent for financial statement users and with appropriate disclosure it allows for a clear understanding of the amount of the "specific provisions" and the "general provisions"; third, provisions are the most rigorous way for taking into account losses already embedded in loans; fourth, they would ensure that the signalling function of net income is unaffected. In addition, provisions do not require a change of corporate law on profit distribution. The main argument against dynamic provisions – that is, they would allow discretionary and opaque earnings management over time – does not seem very convincing since the amount of provisions is based on automatic rules defined by regulators for all banks. On the other hand, a significant advantage of reserves is that they would not interact with the accounting rules and, thus, would leave regulators with more freedom in the choice, for instance, of the cap.

In terms of distributable profits, the two approaches deliver the same result provided that the fiscal treatment is neutral (i.e. provisions are not tax deductible). However, should provisions be considered tax deductible – which seems to us consistent with the fact that they are, by nature, a "true" cost for banks – reserves would determine lower distributable profits. Dynamic provisioning, if tax deductible, would thus provide stronger incentives to banks. In terms of compensation packages, to allow a fair comparison between the two approaches they should be set up with the same incentives and disincentives for management: management

remuneration should be based on "profits available for distribution"; in this case, the only advantage of the dynamic reserving would be accounting neutrality.

## 6. Conclusions

In this paper, we have shown how dynamic provisions may contribute to dampening the cyclicality of the financial system. Along with countercyclical capital buffers, dynamic provisions would strengthen banks' ability to deal with recessionary conditions and maintain an adequate supply of credit to the non-financial sector.

While there are various options for implementing a system of dynamic provisions, we consider that a model based on expected losses as suggested in the Turner Review may represent a sensible way forward. However, we suggest two amendments to the FSA proposal that, in our view, would help strengthen its theoretical underpinnings as well as make it more consistent with a genuine expected loss model.

First of all, we believe that the long-run expected loss of the loan portfolio should be the natural cap to the stock of dynamic provisions: at each point-in-time banks would be required to provision a given percentage of total loans ($\alpha L$) up to the cap. Assuming that a bank has reached the cap on the outstanding loans, it would be required to provision only against the flow of new loans ($\alpha \Delta L$). This guarantees that provisions cover expected losses and that unexpected losses are covered with capital. We also note that all available proposals use a definition of expected loss that should not be confused with the Basel 2 concept. The former is based on the backward-looking history of average annual losses through a whole business cycle; the latter is a forward-looking measure often founded on point-in-time risk parameters. In terms of eligibility as supervisory capital, we suggest that provisions above the IRB expected loss are not reckoned as supervisory capital for the purpose of meeting minimum capital requirements. In fact, $\alpha L$-EL covers losses already embedded in the loan portfolio, but not identified yet; moreover, the possibility to include dynamic provisions in the regulatory capital may reduce their countercyclical role: in recession, they would reduce the fall of profits, but may contribute to the depletion of capital.

On the other hand, should a more conservative cap be set (e.g. $1.25*\alpha L$, as in Spain), the provisions above $\alpha L$ accumulated over time would cover unexpected losses and should thus be eligible for meeting Pillar 2 capital needs arising, from instance, from internal stress testing or automatic rules set by supervisors. However, we doubt that a higher cap can be considered by the accounting standard setters as compatible with IAS 39. Indeed, while political and market pressure may persuade them to accept the expected loss model, we are more sceptical that they would ever agree on the consistency of more conservative approaches with IAS/IFRS. In that case, the stock above $\alpha L$ should probably be treated as prudential reserves.

Second, we believe that dynamic provisions are preferable to prudential reserves. Because they directly affect reported profits, provisions are more countercyclical, more fully consistent

with the philosophy of an expected loss model and at least as transparent as economic cycle reserves. At the same time, since they are based on automatic mechanisms, they would not leave room for earnings management. Accordingly, provisions should be tax deductible. Prudential reserves may be seen as a second-best option, particularly if there is strong willingness to set caps higher than $\alpha L$.

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## Annex 1: Impairment of financial assets carried at amortized cost

According to IAS 39 (par. 58) banks should assess at the end of each reporting period whether there is any objective evidence that a financial asset or group of financial assets is impaired. If any such evidence exists the amount of the loss – the difference between the carrying amount and the present value of estimated future cash flows discounted at the original effective interest rate – should be charged to profit or loss directly or through the use of an allowance account.

The standard clarifies when a financial asset or a group of financial assets is impaired (objective evidence of impairment); only in this case impairment losses are incurred. Events that are objective evidence (and so may lead to an impact on estimated future cash flows) are, for instance: a significant financial difficulty for the issuer or obligor; a default on the part of the borrower; bankruptcy; an observable piece of data such as a decrease in property prices for mortgages in the relevant area; an increased number of delayed payments or an increased number of credit card borrowers who have reached their credit limit and are paying the minimum monthly amount; or local economic conditions that correlate with defaults on the assets in the group (e.g. a decrease in property prices for mortgages in the relevant area).

The standard explicitly states the impossibility to recognize expected losses as a result of future events (par. 59; see also IG E.4.2) because this approach is inconsistent with an amortized cost model.

The assessment of impairment should be done i) **individually** for **individually significant** financial assets; ii) **individually or collectively** for **not individually significant** financial assets; iii) **collectively** once the bank determines that no objective evidence of impairment exists for an individually assessed financial asset, whether significant or not, and it includes the asset in a group of financial assets with similar credit risk characteristics and assesses them for impairment.

There are arguments in favour of an additional portfolio assessment for individually assessed assets that are found not to be impaired: i) impairment that cannot be identified with an individual loan may be identifiable on a portfolio basis; ii) some time may elapse between an event that affects the ability of a borrower to repay a loan and actual default on the part of the borrower; iii) under IAS 39, impairment of loans is measured on the basis of the present value of estimated future cash flows. Estimations of future cash flows may change because of economic factors affecting a group of loans, such as country and industry factors, even if there is no objective evidence of impairment of an individual loan; iv) accepted accounting practice in some countries is to establish a provision to cover impairment losses that, although not specifically identified with individual assets, are known from experience to exist in a loan portfolio as of the balance sheet date.

That said, it is worthwhile remembering that assets that are individually assessed for impairment and for which an impairment loss is or continues to be recognized are not included in a collective assessment of impairment.

The process for estimating impairment considers all credit exposures, not only those of low credit quality. For example, if an entity uses an internal credit grading system it considers all credit grades, not only those reflecting a severe credit deterioration.

For collective impairment, financial assets are grouped on the basis of similar credit risk characteristics that are indicative of the debtors' ability to pay all amounts due according to the contractual terms (for example, on the basis of a credit risk evaluation or grading process that considers past due status).

Different methods are conceivable for grouping assets for the purposes of assessing impairment and computing historical and expected loss rates. For example, assets may be grouped on the basis of one or more of the following characteristics: a) estimated default probabilities or credit risk grades; b) type of loans (mortgage or credit card); c) geographical location; d) collateral type; e) counterparty type (consumer or commercial); f) past due status. More sophisticated credit risk models or methodologies for estimating expected future cash flows may combine several factors, for example, a credit risk evaluation or grading process that considers asset type, industry, geographical location, collateral type, past due status, and other relevant characteristics of the assets being evaluated and associated loss data.

Impairment losses recognized on a group basis represent an interim step pending the identification of impairment losses on individual assets in the group of financial assets that are collectively assessed for impairment. As soon as information is available that specifically identifies losses on individually impaired assets in a group, those assets are removed from the group.

Formula-based approaches or statistical methods may be used to determine impairment losses in a group of financial assets (e.g. for smaller balance loans) as long as they are consistent with the requirements of the standard. Any model used would incorporate the effect of the time value of money, consider the cash flows for all of the remaining life of an asset (not only the next year), consider the age of the loans within the portfolio and not give rise to an impairment loss on initial recognition of a financial asset. A question on the provision matrix is also included in IG E.4.5 but it does not clearly state that it is IAS 39 inconsistent.

## Annex 2: The IASB expected cash flow approach

In June 2009 the IASB proposed the introduction of an expected loss model to be used for determining the impairment of financial assets measured at amortized cost, based on an expected cash flow approach. The idea behind this approach is to use a fair-value like concept for the banking book. In practice, the present value of expected future cash flows is measured using an initial internal rate of return calculated on the basis of cash flows actually expected at inception (taking into account expected credit losses), and not on the basis of contractually agreed cash flows. This initial internal rate of return will be lower than the contractual rate with the difference representing the risk premium charged to the borrower in order to cover the statistically foreseeable risk of non-recovery.

Subsequent or additional impairment losses are recognized through continuous re-estimation of credit loss expectations and notably once an adverse change in credit loss expectations has occurred (i.e. expectations of credit losses are higher than those previously expected). The impairment loss equals the difference between the book value of loans in the balance sheet (amortized historic cost) and the present value of the expected future cash flows, including expected credit losses. Reversal of impairment loss is recognized in profit or loss when there is a favourable change in credit loss expectations.

This method could achieve a more timely recognition of expected credit losses based on the assumption that all loans are subject to a statistically measurable credit risk at inception.

According to the IASB, this approach should better reflect the economic value of assets and lead to an earlier building up of impairment allowances. This should be less cyclical than the incurred loss model since it would imply higher allowances in good times with respect to the incurred loss model. However, a crucial point is that the reduction of cyclicality depends very much on banks' ability and willingness to estimate through the cycle expected losses at inception. In the light of the experience of Basel 2 ratings, this does not seem likely. Should expected losses be estimated in a point-in-time fashion, the risk of cyclicality may indeed increase.

Moreover, in our view, this approach may introduce further complexity and put additional burden on institutions' IT systems, in particular for smaller banks, not to mention model risk.