TECHNICAL NOTES AND MANUALS

The Role of Bank Diagnostics in IMF-Supported Programs

Joaquin Gutierrez, Dermot Monaghan, and Alvaro Piris

Monetary and Capital Markets Department

INTERNATIONALMONETARYFUND

INTERNATIONAL MONETARY FUND

Monetary and Capital Markets Department

The Role of Bank Diagnostics in IMF-Supported Programs

Prepared by Joaquin Gutierrez, Dermot Monaghan, and Alvaro Piris
Authorized for distribution by Tobias Adrian

December 2019

JEL Classification Numbers:	E58, G21, G32
Keywords:	Bank Diagnostic, Asset Quality Review, Solvency Stress Test, Bank Capital, Bank Recapitalization.
Authors' E-Mail Addresses:	dmonaghan@imf.org apiris@imf.org jgutierrezgarcia@gmail.com

TECHNICAL NOTES AND MANUALS

The Role of Bank Diagnostics in IMF-Supported Programs

Prepared by Joaquin Gutierrez, Dermot Monaghan, and Alvaro Piris

Diagnostic studies are essential to IMF programs in situations of significant bank weakness and when regular disclosures are not reliable. Restoring bank solvency is key to maintaining financial stability and, therefore, the ultimate policy objectives of a Fund-supported program. Bank diagnostics aim to ensure that existing potential losses and capital needs are identified in a timely manner and, in case public support is needed, the relevant cost is prudently incorporated in the program financing envelope. Diagnostic studies provide assurances that financial stability risks are reasonably quantified and provide information essential to: (i) understanding the scale and scope of banking sector problems; (ii) executing strategies for bank resolution and restructuring, including quantifying recapitalization needs; and (iii) estimating any financing needs with reasonable certainty.

There is no single template for diagnostic studies that fits all cases. Though an asset quality review (AQR) will always be a central component, there are other aspects, such as stress tests or reviews of bank viability and funding structures, whose relevance depends on country circumstances. While a diagnostic exercise provides a point-in-time snapshot, it can go further and be seen as part of a process of discovery and remediation of the factors at the root of the banks' problems. Diagnostics are undertaken by local authorities based on a robust governance structure that provides credibility and quality assurance through independent, external participation. Diagnostics should consider local conditions and, where resources are available and qualified, be performed with local participation to enhance ownership and political acceptance. Communication is a key consideration, with the level of information released publicly often being dictated by circumstances.

This note provides practical guidance, drawing on experience. Rather than looking at diagnostics as a narrow capital compliance event, the note advocates a building block approach to assessing banking businesses, and to enable forming a view on long-term viability as a basis for action with respect to each institution reviewed.

Features of observed international practice are also summarized, drawing on recent diagnostic studies in Europe, and on extensive earlier experiences in a range of emerging and developing country contexts.

CONTENTS

GLOSSARY

AMC	Asset Management Company
AQR	Asset Quality Review
BdP	Banco de Portugal (Central Bank of Portugal)
BSA	Balance Sheet Assessment
CA	Comprehensive Assessment
CAMEL	Capital, Assets, Management, Earnings, Liquidity (supervisory rating system)
CBE	Circular del Banco de España (Circular of the Central Bank of Spain)
CBI	Central Bank of Ireland
EBA	European Banking Authority
ECB	European Central Bank
GAAP	Generally Accepted Accounting Practice
IAS	International Accounting Standard
IFI	International Financial Institution
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
LGD	Loss-Given Default
LTV	Loan-to-Value
MIS	Management Information Systems
NPL	Nonperforming Loan
PD	Probability of Default
PMO	Project Management Office
TNM	Technical Note and Manual
TOR	Terms of Reference

I. RATIONALE AND SCOPE[1]

In times of macrofinancial stress, diagnostics of the condition of banks provide critical input to resolving problems, providing direction, and informing decisions. In countries that seek IMF support to correct macro-financial imbalances, meeting the ultimate program goals of restoring depositor and market confidence, financial stability, and conditions for growth, often requires restructuring and recapitalization of the banking system. However, the reliability of the information available on the condition of banks and their borrowers is usually insufficient to lay out a roadmap at the start of the IMF program. This is often due to weak governance and oversight of the banking system and results in, among others, loan misclassifications, overvalued loan collateral, underestimated recovery costs, overvalued securities, or uncertainty from deteriorating economic conditions. Standard accounting disclosures are usually inadequate for forming a view on the true economic condition and prospects of institutions in situations of economic stress. Thus, countries and Fund staff often have to design a strategy that includes a diagnostic of the banks' situation, centered around an AQR process, accompanied by a comprehensive strategy to address the findings. Bank diagnostics, which are undertaken by independent experts, sometimes from overseas if domestic auditors lack expertise or credibility, have taken place in conjunction with some IMF programs since the 1980s.

Bank diagnostics are often the first step toward implementing a comprehensive financial sector strategy. The diagnostics provide input for the strategy, which should address: (i) how much bank capital is needed and how those needs will be met; (ii) a method for deciding which, if any, banks will receive public support, which could survive on their own, and which are not viable and should be closed; and (iii) a communication strategy. The financial sector strategy is often a key element of a Fund-supported program and sets out the broad approach to financial system restructuring, governance, and oversight, and how liquidity and financial stability will be maintained.

The core focus of a diagnostic is to quantify the size and distribution of problem assets in banks and to estimate their current and future losses. In addition to losses already incurred, banks can continue to accrue losses from several sources, including from: (i) the cost of financing nonperforming assets; (ii) further nonperforming loan (NPL) formation and deterioration in loan recovery values; (iii) excessive operational costs; (iv) losses from extending fresh credit to keep problem borrowers from bankruptcy; and (v) fraud and asset stripping. A diagnostic will provide information to help identify the source and likelihood of additional losses and; therefore, insight into how much of a buffer of additional capital above minimum requirements banks may need, or any additional policy measures needed to address bad assets.

Diagnostics form part of an ongoing process rather than a point-in-time event. Identifying and remedying capital shortfalls in banks is a key element in restoring confidence in the banking system. But, typically, this will not be enough to ensure that viable banks survive the downturn and can contribute to economic recovery. The fundamental problems afflicting banks must be addressed through restructuring.

[1] The authors would like to acknowledge the contributions provided by Luis Cortavarria-Checkley, Olivier Frecaut and David Parker through written comments and discussions. We also benefitted from review comments provided by MCM colleagues. Remaining errors are our own.

Local stakeholders are often incentivized to underplay problems in the banking system.[2] Bank managers and shareholders risk losing their jobs or investments if their bank is shown to be insolvent, undercapitalized, or poorly run; supervisors fear being held accountable for banking problems by politicians, the media, and the public; and political leaders are incentivized to delay recognition to avoid being blamed for problems in the banking sector by the public, and to avoid having to request to the government funds for bank recapitalization and resolution.

Diagnostic exercises involve considerable expert judgement but provide important insights into bank restructuring decisions. The valuation of financial contracts is not an exact science and estimating the "true" economic value inevitably involves judgement. In situations of financial stress, valuation is a moving target. Also, diagnostics are performed under pressure, with limited data and resources, and uncertainty from economic and financial volatility may quickly call the results into question. These factors explain why it is advisable to assign the task of performing the diagnostic to independent experts and to consider several key aspects when assessing the outcome of the exercise, such as accounting conventions, valuation practices and assumptions, or the features of the local environment. Further, diagnostic exercises feed directly into the usually highly politically charged issue of who should bear bank losses. These factors make diagnostic exercises a complicated process, subject to press and industry scrutiny, and sometimes political controversy. In the context of a Fund-supported program, diagnostics are commissioned by the local authorities, must provide information beyond a capital shortfall, and provide input for a range of assessments on each bank's viability.

II. DESIGN CONSIDERATIONS

A. A Building Block Approach

Bank diagnostics should aim to identify the underlying causes of banks' problems. Diagnostics can be arranged as building blocks to provide information needed at each stage of the strategy to manage banking sector problems. A robust diagnostic of the banks' condition should consider the following issues and undertake discrete activities based and prioritized on the levels of identified risk:

- Asset quality (good, bad, and problematic, including losses and provisions) and adequacy of capital;
- Liquidity, including expected flows of funds, and how these are managed;
- The sufficiency and quality of earnings (pre-provision profits net of accrued and capitalized interest on NPLs);
- Capacity to work out and to recover problem loans (and good new loans);
- The business base (clients, products, people, network, costing, and pricing);
- The financial group structure (parent and holding companies above and subsidiaries below the bank) and its (ultimate) ownership structure;

[2] David Scott, "A Practical Guide to Managing Systemic Financial Crises: A Review of Approaches Taken in Indonesia, the Republic of Korea, and Thailand," 2002.

- Scope and (potential) effects of intragroup and related-party transactions;
- The adequacy of internal governance and Board processes; and
- Management quality and the integrity of controls and systems.

In those Fund programs where bank diagnostics are deemed critical, they have generally prioritized asset valuation and bank solvency. This is to allow for gauging the total financing needs of the program, assessing the fiscal options, and assembling a consistent financial envelope and overall program. The onsite reviews of the diagnostic typically focus on valuing illiquid assets and addressing solvency-related issues, which helps to ensure that banks have the capacity to meet their long-term financial commitments and, thus, depositors and investors can have confidence that they will be repaid.

B. Risk Assessment

The design of bank diagnostics should be based on an assessment of risks. Critical risk factors (e.g., related-party exposures, banks' capacity to recover value from NPLs, business line profitability, intra-group relationships, exposure to a weak sovereign, poorly hedged security or foreign risk, etc.) vary across countries. The assessment should identify early on the areas where problem assets may accumulate to calibrate the scope and intensity of the diagnostic reviews accordingly (Appendix I). Typically, the assessment should include an evaluation of the perimeter of entities under review to ensure that risks from intragroup relationships, related parties, and insider activities are adequately covered where relevant. Other areas to consider, including off-balance sheet contingencies below the line, are shown in Appendix I.

In Fund programs, staff should undertake the initial 'stocktaking' based on existing information on bank conditions, known gaps, and local issues and use this to inform the design of the diagnostic. The stocktaking should cover:

- The role and quality of local factors, e.g., accounting practices, the reliability of supervision, and the effectiveness of the judicial system in executing creditors' rights (Box 1);
- Identification of the essential components of the diagnostic to calibrate their scope and extension, and cover all key relevant risk areas (Appendix I);
- Sequencing and early planning on additional steps following the diagnostic, e.g., validation of business plans and assessment of viability;
- Consideration of potential obstacles to resolution, and any information gaps; and
- An early analysis and estimation (a back-of-the envelope calculation) of financial needs and possible capital requirements, and technical assistance needs.

BOX 1. Key Considerations in Designing a Bank Diagnostic Exercise

- ***Incentives**:* Key stakeholders are usually not interested in revealing losses. Bankers try to preserve shareholder value, maintain market liquidity, avoid revealing weak or corrupt lending practices, and keep their jobs through a "hide, hold, and hope for recovery" strategy; auditors may focus on retaining their client; supervisors on not losing face, while senior officials and policymakers may want to deny or minimize potential fiscal costs, playing for time and hoping to maintain relationships with powerful bank owners and managers.
- ***Standing and probity of ultimate owners**:* Shareholders that wish to retain control must show capacity and willingness to support the bank and act as a source of strength. Diagnostics must take account of efforts to obscure ultimate ownership, dubious financial standing or self-financed capital, and the possibility of underlying fraud. Bankers may also try to use political connections to weaken the scrutiny.
- ***Integrity and professionalism of Boards of Directors and senior management**:* Boards and managers may lack experience, display recalcitrant attitudes, and fail to respond diligently to the requests of supervisors, or benefit from inside lending, abuse, and fraud. Their record in placing the interests of depositors and creditors ahead of shareholders is critical to earning continued trust.
- ***Financial standing of the sovereign**:* Large exposures to a weak sovereign can represent a substantial risk to banks, while sovereign debt restructuring can potentially render whole banking systems insolvent. Debt sustainability concerns can limit the scope for using public resources for recapitalization.
- ***Resolvability:*** Impediments to resolution can include complex corporate structures (including cross-border), opaque intergroup relationships, undeclared related-party exposures, operational interdependencies, reputational risks, and hidden intra-group guarantees and shared fund flows. Legal or institutional impediments to foreclosure may erode the loss-absorbing capacity of collateral.
- ***Bank key control functions**:* Asset quality and the validity and reliability of data and information depend on control functions. Risks include mis-recorded or unrecorded assets and liabilities, structural gaps in credit underwriting, lack of reliability of loan review functions, and stratagems to hide losses or engineer false gains.
- ***Ineffective audit and onsite inspection**:* Weak external oversight through insufficient onsite testing of information and systems, lack of independence, stature, resources, and incentives of supervisors and auditors, and political capture or corruption, resulting in poor or unreliable information.
- ***Loan classification and provisioning rules**:* Evergreening (re-aging and refinancing); lender forbearance; inconsistent application (e.g., loose overdraft rules); arbitrary and optimistic general provisioning model inputs (including under International Financial Reporting Standards such as IFRS 9); lack of empirical loss evidence; and optimistic collateral valuations are all potential problem areas.
- ***Infrastructure (completeness and efficiency of systems)**:* Litigation risks; inefficient collateral enforcement; unreliable judicial systems and property registration; lack of ancillary professions, such as valuation experts or bailiffs; or politically protected or loss-making public companies warrant consideration.
- ***Ineffective regulation***: Inappropriate risk weights from internal-ratings-based models can underreport regulatory risk; nonconsolidated regulatory reporting can allow delinquent assets to be hidden from view in nonbank subsidiaries; and weak regulatory capital definitions can result in inability to absorb loss (e.g., excessive reliance on hybrid instruments or deferred tax assets).
- ***Macroeconomic expectations***: Material expected changes in future exchange rates, interest rates and collateral value need to be factored in, as well as any expectation for continued economic deterioration that will impact on debt affordability.

C. Timing of Bank Diagnostics and Relation with Program Financing Envelope

The financing envelope of an IMF program can be estimated ahead of completion of a comprehensive bank diagnostic. Bank diagnostics take time; supervisory and financial resources limitations, time constraints, and the urgency of finalizing program design sometimes justify settling on a risk-targeted AQR to produce an estimate of capital needs to be considered in program financing. A well-done expert estimation, possibly including a desk-based stress test or sensitivity analysis, can generate a usable estimate of capital needs and financial implications for the program while a detailed review is being completed.

Such an approach could be used to make an initial mapping or triage. This is the process of separating banks into three groups (i) those that can overcome the stress with their own resources; (ii) those that will require restructuring with public resources; and (iii) those that should be closed. A process of enhanced assisted bank inspections could then provide an efficient method of following up on restructuring plans. It also ensures greater ownership and political acceptance and helps build capacity.

A more comprehensive suite of diagnostics may be necessary over the course of the program. For example, if the credibility of local supervisors and auditors is low, prudential standards are weak, and tighter norms are used to estimate the true condition of the banks in the diagnostic, or the banks have suffered a large shock affecting many business lines. The diagnostics can be made-up of several basic building blocks that are phased in through the timeline of the program (Box 2).

BOX 2. Work Streams in Full-Scope Bank Diagnostics

Diagnostics consist of several work streams sequenced over time.

Comprehensive approaches followed in the past include: (1) full-scope onsite inspections; and (2) specialized audit reviews. Usually, both exercises have been complemented in varying degrees with intensive assessment of the financial viability of the underlying business models.

More recently, during the European crisis, the approaches have been divided in smaller blocks: (1) balance sheet assessments (BSA); (2) asset quality reviews; (3) data integrity verifications; (4) loan-loss forecasts; (5) risk-weighted asset reviews; (6) loan-loss provision reviews; and (7) forward-looking regulatory solvency stress tests.

Other relevant work streams include: (1) distressed credit operations reviews (to assess the capacity of loan work-out and recovery activities); and (2) operating profit analysis (to evaluate the profitability of the business model, and the capacity of pre-provision profits to absorb and normalize credit costs).

D. Ensuring Credibility

The bank diagnostic approach must be credible. A number of practices can help ensure the credibility of the exercise, including the following:

- Comprehensive terms of reference (TOR) addressing the scope and assessment methodologies, with sufficient detail on all essential elements, such as loan classification and provisioning to ensure objectivity, transparency, and rigor.

- Identifying the accounting and regulatory standards that will be applied, which may involve prior passage of regulatory reforms, ensuring that there is an adequate legal basis for assessment and, critically, enforcement of capital requirements or other actions to remedy the shortcomings found by the review.

- Realistic macroeconomic forecasts on variables related to affordability (e.g., GDP growth, unemployment, exchange rates, interest rates) and collateral values (residential real estate index, commercial real estate index, exchange and interest rates) to ensure consistent collateral values are applied and future environmental risks are fully captured.

- Disciplined project management framework with an explicit governance structure (credible oversight).

- Use of external experts if the evaluation, including the possibility of international firms or experts if the credibility of local audit and supervisory standards is in question, with local participation to bring in-depth knowledge and to enhance ownership.

- Allocate sufficient resources (and political will) to review and redo work if gaps are identified.

- *Ex ante* identification of the strategy and financing sources to remedy the problems found in the exercise; lack of clarity regarding the possible sources of funding for recapitalization can undermine the credibility of the exercise and lead to accusations that results have been "tailored" to fit within the resource envelope available.

E. Terms of Reference

TORs for the bank diagnostic set out the scope, depth, timing, and sequencing of the exercise. They are technical Memoranda of Understanding among stakeholders on how the diagnostic will be conducted. In a program context, this document is drafted by the authorities and their advisors in consultation with IMF staff. It is sometimes produced with the assistance of third-party consultants. The document is also used for engaging independent experts to undertake the individual elements of the diagnostic. More detailed TORs are often subsequently developed as part of the contract agreement between the bank supervisor and the independent experts.

The TOR should be designed to enable a rigorous assessment of key variables. Similar to supervisory CAMEL ratings, the key variables to be assessed should be (i) net Capital; (ii) Asset quality; (iii) Management; (iv) Earnings; and (v) Liquidity flows. The typical structure of the TORs will include details on the following:

- The scope of the diagnostic (e.g., BSA and off-balance sheet plus profit and loss versus limited AQR);

- The information to be provided to the reviewers (e.g., records, data tapes, macroeconomic scenarios, etc.);

- The reports, opinions, and information to be delivered by the reviewers;

- The standards of field work and reporting (say, International Standards of Auditing);

- The referent standards of accounting (say, local Generally Accepted Accounting practices (GAAP), or International Financial Reporting Standards (IFRS), such as IFRS 9);

- Any modification required to the above as per detailed agreed-upon procedures; and

- The specific methodologies and procedures requested for sampling and examination.

The TORs must define clearly the scope of the diagnostic. For a BSA, for example, the scope should include assurances that all liabilities and contingencies are accounted for. More generally, the key issue is almost always the reliability of loan classification and the valuation of loans. Other risks (see Appendix I) should also be covered in detail to the extent that they are a source of concern. Any exclusions should be justified based on the initial risk assessment, even for apparently straightforward accounts (for example, cash balances due from banks or in correspondent accounts may need to be directly verified to ensure they exist and are free from encumbrance).

The performance of internal credit rating systems and the adequacy of loan-loss buffers should always be a key focus. The TORs should include an assessment of key credit risk infrastructures. This includes the objective criteria and risk drivers followed by the banks for grading loans and for provisioning. It is typical to see large volumes of loans reclassified from performing to distressed grades following an independent diagnostic, and this should result in regulatory reclassification and lead to the application of higher regulatory risk weights to those loans and additional loss reserves. Loss estimates should be based on conservative assumptions, with recovery values based on the expected value at the time of liquidation, taking account of forecast changes in collateral market prices and currency fluctuations, as well as conservative discounts for forced-sale and time-value of money effects.

Independent valuation of collateral is usually necessary, and even this will involve significant judgement. The TOR should require independent valuation of collateral by accredited agents, using an internationally recognized valuation approach (such as International Valuation Standards). Given that some valuation techniques can significantly overestimate collateral value in a distressed environment, the valuations should be limited to the income (for assets with cashflows) or market approach. The diagnostic also often needs to consider the effectiveness of the creditor rights and institutional (especially judicial) frameworks and their impact on collateral value through the ease and speed with which collateral, particularly real estate, can be foreclosed, seized, and sold.

In addition to sampling actual loans and collateral, the assessment must test the reliability and credibility of the methodologies used to estimate loss provisions (see Appendices IV and VI). The assessment should cover individual and general (i.e., collective, "incurred but not reported," and lifetime expected credit loss) provisions. Ideally, assessment of the credit information available, the loan underwriting process, the internal loan review and risk controls, and the policies and capacity for loan recovery and debt restructuring should also be covered.

III. KEY TECHNICAL FEATURES

A. Sampling

The review of loans files and the independent valuation of collateral are the most time-consuming and resource-intensive tasks of a bank diagnostic. With some loan files taking a day or more to review, it is usually impractical or impossible to review all assets in a portfolio. While the largest and less common loan files are typically reviewed individually, other loan portfolios are often segmented into pools of homogeneous risk for sampling. A similar approach is applied to collateral valuations. The segmentation has to be done in a way that groups loans with

similar risk characteristics—adjustments to asset quality and collateral value of the sample set are subsequently extrapolated to the rest of the segment.

The appropriate sampling is highly dependent on the effectiveness of banks' internal controls and on the reliability of the data. The weaker the control environment, the larger should be the size of the sample, especially if forensic reviews are performed to "discover" abuse or investigate "unusual transactions." Reading a loan file is usually insufficient to determine its condition. Tracking loan proceeds (noting deposit accounts used) and the sources of loan servicing are essential to uncover the factors underlying a protracted problem debtor or a related party. Extra time must be factored in to trace transactions to discover the full scope of insider transactions.

The sampling chosen should be sufficient to form a view about the overall risk profile and provisioning in the credit segments under review. Sampled loans are re-underwritten one by one, not with models. Loan reviews are the only way to identify if forbearance and evergreening practices distort the classification of problem loans and the quantification of provisioning estimates. Loan reviews, not modeling, elucidate the causes of the problems and provide a way to identify NPLs whose interest revenue is accounted for, but never paid in cash. The TORs must decide whether to extrapolate from samples or to achieve high loan coverage with a bias always toward higher direct loan coverage.

TORs should be explicit regarding the sampling methodology and selection technique. There are three basic approaches to sampling (Appendix II). The choice of the approach depends on the objectives of the review and the resources available. By sampling, a review can test the effectiveness of credit risk processes, such as internal credit classification and provisioning, and extrapolate findings to a larger population. Extrapolation is not conducted in all the reviews and requires stratification into homogeneous pools of credit type and quality. Bank examination policies always favor large coverage (above 40 percent of total exposure) for problem banks and across all credit portfolios, including retail portfolios identified as material during the initial risk assessment.

B. Loss Dynamics and Loan-Loss Forecasts

A point-in-time bank diagnostic provides a static "picture" of the bank's situation. However, it is important to understand future flows (the sources of losses). The success of the strategy for banks depends on recognizing the sources of the flow of losses and eliminating them. Heavy losses on existing defaulted loans may be concealed if future declines in collateral values and adverse changes in foreign exchange and interest rates are not fully considered. Further deterioration in economic conditions could also lead to significant new NPL formation. An AQR plus a loan-loss forecast to identify capital needs will not be enough if the underlying sources of loss have not been addressed through restructuring of the bank's operations to ensure long-term viability.

Bank losses can arise from several sources. Beyond losses on NPLs, other common sources of balance sheet pressure and losses are large deposit withdrawals, continued lending to bad borrowers, forced deleveraging, operational cash-flow losses, and other forms of asset stripping. A bank may be insolvent, but still have access to funding: it can then continue to operate and generate new losses. Alternatively, a recapitalized bank with stable liquidity may still be making losses from some of the above-noted sources and may not be viable in the long term (if operating costs exceed revenues and cannot be effectively priced and cashed in).

Loan-loss estimates usually have to consider multiple perspectives and time horizons. A point-in-time estimate is often applied to identify the 'clean balance sheet' ahead of applying a solvency stress test, and to clarify if past financial reports have to be restated. Estimates of future losses are needed for regulatory capital, which is based on a one-year forward-looking estimate. Lifetime loss estimates have been used as input to identify transfer values when moving assets to an asset management company (AMC) as part of balance sheet restructuring and is becoming more common as accounting standards (IFRS 9) apply an expected credit-loss approach.

Any plans for loan-loss forecasting need to be factored into the AQR design. AQRs typically lead to an adjustment of loan classifications and losses at the reference time point, resulting in a step-increase in probabilities of default (PDs) and losses given default (LGDs) that presents technical challenges for loss forecasting. This step-increase can be overcome by adjusting historically reported NPL levels or careful selection of the NPL forecasting approach. The selection of approach is usually dependent on information availability, and very different forecasting models are often applied to different asset classes. Although the conceptual links between asset quality and loan-loss forecasts can vary, the links based on commonly used parameters are shown in Appendix III.

C. Accounting Considerations

Accounting standards provide scope for banks to take optimistic views on losses. A key objective of AQRs is to obtain a reliable estimate of problem assets in a bank, whilst also undertaking a prudent estimation of loss. Accounting standards aim at presenting asset values based on verifiable facts and analysis, but usually offer significant scope for interpretation. Bankers may know that a borrower has little prospect of repaying in full and on time, and with questionable collateral, but are allowed to take an optimistic accounting view based on historical data. Banks can thus engage in excessive forbearance and under-provisioning at the individual account level that results in unrealistic valuations of the bank's credit portfolio as a whole.

Applying a conservative interpretation of accounting standards in a diagnostic is thus justified. When undertaking an AQR it is important to keep in mind that accounting standards:

- Are often backward-looking (for example, International Accounting Standard (IAS) 39 allows provisioning only for incurred losses). This can result in significant concealment of losses in weak macroeconomic environments as collateral values will lag, continuing to decline into the future. This feature led the European Union to go beyond the accounting standards and consider expected losses in the Comprehensive Assessment. Even if they are forward looking (e.g., IFRS 9 applies expected credit losses), the loss forecasts may not be based on consistent and conservative macroeconomic forecasts and, thus, cannot be taken for granted;

- Are principle-based, which provides discretion in loss recognition, particularly in the absence of supervisory guidance;

- Favor income accrual over cash revenue recognition for problem assets. Accrual of unearned interest income on bad loans can significantly distort interest income, loan-loss provisioning coverage ratios, and overall capital levels;[1] and

- Authorities normally set out little guidance in terms of implementation (see Appendix V on collective provisions under IFRS).

Valuation of securities and trading assets depends on portfolio classification. The valuation of securities may also allow accounting arbitrages that the bank diagnostic must consider. Recording assets as 'held to maturity' can help avoid booking heavy mark-to-market losses on marketable and liquid assets following an economic event. Recycling portfolios, including repossessed assets, across different portfolios and entities within a group may be used to place latent losses outside the scope of the review. These and other key local factors have to be identified in the initial stocktaking.

Government bonds held as bank assets are a special case. Although a government can default on its debt and undermine the solvency and liquidity of the entire banking system, the impact is more nuanced in most cases.[2] Typically, fiscal conditions deteriorate in parallel with bank and broader economic distress, and the market value of government bonds drops. Using the market value of government bonds in such an environment could make the banking system insolvent. If banks hold large quantities of long-term bonds yielding a low or negative spread on funding costs (or if they have received those bonds from an AMC or in a recapitalization), the portfolio can undermine earnings. Allocating bonds to the investment account at face value could defer future loss recognition, providing time for the crisis and bond values to stabilize. However, this is sustainable only if there is a way of funding such a long-term position at a cost of financing that is affordable. One approach, for example, if recapitalizing banks using government bonds, is to segregate the portfolio into existing holdings (marked to market) and new recapitalization bonds (held at face value, and which may not be marketable, although this entails disadvantages in liquidity). Any requirement to mark-to-market securities should be seen in the context of the overall strategy for the banking system.

Local accounting norms should be interpreted conservatively. Unless local generally accepted accounting practices (GAAP) satisfactorily resolve the different asset valuation issues, the TORs should provide precise ad hoc rule-based criteria to uniformly appraise bank portfolios (for example, the Spanish AQR in 2012 followed stricter criteria for refinancing and forbearance, including collateral valuation with rule-based haircuts, which were incorporated into Banco de España regulation). Rather than changing accounting standards, an approach followed has been to strengthen prudential regulations, specifically for loan classification, provisioning, and collateral, to achieve conservative valuation practices, with AQRs applying the new regulations. Appendix IV shows a set of

[1] For example, the IMF program with Ireland in 2011 assumed a foreclosure strategy that informed loan-loss *forecasts* (economic lifetime loss), added to the *incurred* loss estimation (accounting loan-loss provisions). In fact, banks engaged in lender forbearance and did not foreclose and liquidate problem loans. As a result, losses accounted were below those forecasted. Banks showed high levels of capital but reported very high Texas ratios (net NPLs to capital above 130 percent) because there was no actual loss crystallization.

[2] See Dell'Ariccia *et al*, 2018, "Managing the Sovereign-Bank Nexus," available at: https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2018/09/14/Managing-the-Sovereign-Bank-Nexus-45133

'objective' loan underwriting criteria to solve a number of systematic issues confronted in country loan reviews to render local GAAP or IFRS concrete and clear.

However, the calibration of accounting criteria entails both upside and downside risks. Banks, through carefully managed relationships with borrowers, tend to hold optimistic views of their ability to repay, and of collateral values. This can lead to successive losses, with remedial measures or recapitalizations proving to be too small. On the other hand, an excessively pessimistic assessment will lead to an unnecessarily high burden being placed on the banks, and possibly to unwarranted public recapitalizations or interventions, with negative fiscal, credit, and economic effects. Appendix V shows one example using eight different parameters, each of which can be "optimized" to bias the result.

Loan-loss provisions

Accounting provisions are critical to loss recognition, but standards and oversight vary considerably across national borders. The creation of a provision for loans typically leads to a loss in banks' net asset value through a reduction in the measured value of the loans. Although some regulators apply mechanical calendar-based provisioning rules, many apply IFRS or other standards and, given the lack of international agreement on provisioning rules, there is substantial scope for variation and application of optimistic assumptions.[3]

General provisions are usually based on limited and optimistic data. As forecasting loan losses via sampling in retail portfolios has limited efficiency, TORs for bank diagnostics should specify an approach to ensure that loan classifications and loss-forecasting assumptions are representative, and that collective provisioning is sufficient (including expected credit loss models under IFRS 9). In retail segments, provisioning is based largely on modeling algorithms that use roll rates, migration analysis, aging of arrears, loan-to-value ratios (LTVs), and other techniques for pool provisioning. The particular techniques need careful assessment to confirm their adequacy or to decide on an alternative. Comparing deviations across banks and products helps to visualize the degree of conservatism in model inputs and management estimates. This requires first investigating re-aging and refinancing practices to factor them into the calculations of the provisioning algorithms.

The use of a 'central model' can provide a benchmark to test the sufficiency of general provisions. This approach quantifies the effect of using parameters that are more conservative than those being applied (for example, collective provisions under IAS 39 formerly and expected credit losses under IFRS 9). The Central Bank of Ireland first used this approach in 2013 on exit from the externally supported program. The European Central Bank (ECB) generalized this approach in the 2014 comprehensive assessment and developed a challenger model approach to test the sufficiency of collective provisioning.[4]

D. Assessing Bank Viability

Restructuring problem banks to restore viability is a key challenge. Achieving bank viability is critical to restoring financial stability. Viability is the central consideration in deciding the future of a bank (whether it is

[3] The BIS and ECB issued guidance on regulatory treatment of accounting provisioning in March 2017. See https://www.bis.org/bcbs/publ/d401.htm and https://www.bankingsupervision.europa.eu/ecb/pub/pdf/guidance_on_npl.en.pdf

[4] See: ECB, "Asset Quality Review," Phase 2 Manual, March 2014. Section 7: Collective Provisioning Analysis.

closed or restructured). Besides considering the renewal of the management team, key factors in restoring viability include the bank's underlying commercial franchise and service levels, the scope for balance sheet restructuring, its ability to fund operations and to recover problem assets, the scope for cost rationalization, and an appropriate recapitalization level (Box 3).[5]

BOX 3. Bank Viability Assessments

A bank is considered to be viable if it passes a dual test of market and financial viability. The ***market test*** requires a bank to demonstrate a tangible business base of clients and products that are sufficient—in normal conditions—to recover full cost allocation (including expected credit costs and the cost of capital). The ***financial test*** requires reasonable certainty regarding asset quality and adequate provisioning, with actual performance (or within a reasonable timeframe) demonstrated by:

- Sustainable profitability,[1] with growing net interest margin and return on equity normalizing to market rates; and
- Positive pre-provision profits to absorb normal credit costs net of accrued income on NPLs.

A common practice to assess bank viability is to combine bank diagnostics with business plans provided by the bank (considering also that such plans are generally optimistic). The business plans should include the following metrics:

- A moderate Texas ratio[2] (i.e., comfortably below 100 percent);
- Capacity to underwrite and disburse new loans, to recover problem loans and to reduce NPLs;
- No large balance sheet mismatches or excessive concentrations;
- Ability to return to wholesale funding markets; and
- Adequate capitalization and ability to attract private investors.

The business plans should be quantified, contain performance indicators and be time-bound. They should include: (1) line activity (market segment shares, turnover, number of clients and accounts served, and expected volumes); (2) financial, capital and liquidity plans; and (3) forward-looking projections under alternative scenarios (base and adverse).

———————————

[1] For example, a market average return on equity (ROE) of circa 8 percent was used in the European crisis as a longer-term benchmark to identify if deeper balance sheet and business restructuring were needed. The ECB sets a target range of 6% to 10% ROE to assess viability (see ECB Financial Stability Review, November 2018).

[2] Gross nonperforming assets (NPLs plus real estate owned) divided by the sum of capital and loan-loss reserves.

Business plans can be used to help assess bank viability and monitor progress. A bank's underlying business comprises products and services, delivery channels, and a clientele eager to pay for them. These elements are often taken for granted and are rarely audited or assessed comprehensively. A business plan justifies the bank's survival as an ongoing commercial entity. Recovery of the underlying business will allow the bank to reach break-even with full cost allocation, mitigating any concerns about the sufficiency of capital buffers. Eventually, both the restructuring of the bank's balance sheet and its operations, and the resulting capital structure, must enable banks to be profitable. This will facilitate exit strategies for public support and attract interest from reputable investors to enter the market.

[5] The State Aid Regulations of the Directorate General of Competition of the European Union provide a number of concepts and standards to assess viability, and for the design of business plans.

Key elements in assessing bank viability include:

- The need to quantify the impact of recapitalization instruments (e.g., cash, bonds, hybrid instruments, deferred tax assets) on profitability, cash flows, and liquidity;
- Tracking the evolving structure of the balance sheet (divestitures, deleveraging) and the impact on the bank's capacity to generate earnings;
- The pace and effectiveness of problem loan work outs; and
- Reducing the cost base of the bank by fitting the staff and the branch network to the business volumes foreseen in the business plan, and which are actually realized.

Viability assessments take into account the structural deficiencies of a country's financial sector. Countries experiencing banking crises have often had structural problems in the banking sector. Typical problems include "overbanking," poor profitability, inefficiencies, and cross-subsidized pricing. The resolution-restructuring process should be consistent with a realistic view of the financial system once the process is complete, to service the needs of the economy and its agents on a sustainable basis.

Banks' business plans should be rigorously challenged for conservatism and coherence. Bank business plans tend to be optimistic and have to be benchmarked to ensure that assumptions are consistent with an aggregate post-crisis financial system that is solvent and viable. The coherence of the plans in aggregate should also be considered—e.g., whether the growth rates in deposits or lending assumed across all the banks are consistent with the macroeconomic outlook.

E. Stress Testing Regulatory Solvency

Stress testing is a tool to model future loss potential. Solvency stress tests are sometimes applied as a stand-alone diagnostic in IMF programs, but the more common practice is to use them alongside other diagnostics (i.e., following AQRs) especially in cases where substantial consolidation and balance sheet restructuring is necessary. Stress tests also help to assess the resilience of banks in environments of significant uncertainty. Stress tests can also be used as a triage tool to assist in determining thresholds for using public funds, or to provide for an initial classification of banks, and to help define the general structure of a crisis-management strategy. However, stress tests alone are not suited to establishing the condition and viability of individual banks and are not substitutes for an AQR or for assessing business models.

There is a wide array of stress test approaches and methodologies. Bottom-up stress tests are exercises conducted by individual banks, applying a methodology and assumptions set, and overseen by the supervisor. In contrast, top-down tests are high-level exercises, designed and performed by the supervisors, which apply the same assumptions and models to all banks. When rigorously executed, bottom-up exercises provide more granular results that are more accurate and, when banks cooperate fully, are also preferable due to time and information

considerations.[6] A dynamic balance sheet approach, where balance sheet composition changes as a result of restructuring, is employed in programs to account for potentially significant changes in profit and loss, revenue, costs, and regulatory risk weights.[7]

The degree of conservatism and credibility of stress tests depend on the macroeconomic assumptions, time horizon, and pass/fail thresholds.[8] Stress tests often apply a baseline and an adverse scenario. The baseline scenario uses baseline macroeconomic forecasts and the adverse scenario typically applies a shock to key forecast variables (e.g., two-standard deviations or ninety-fifth percentile shock to GDP growth). Although the time horizon applied for regulatory capital purposes is usually one year (as per agreed Basel rules), significant losses can occur beyond that horizon and supervisors typically apply a two- or three-year horizon to stress tests. Pass/fail thresholds are usually applied to regulatory capital ratios in both the baseline and adverse scenarios, with the severity of the threshold defining the degree of conservatism.

Loan-loss forecast inputs to stress tests should be produced by independent experts. Banks are usually best placed to produce, under supervisory guidance and oversight, most inputs for granular profit-and-loss forecasts employed in stress tests. However, loan-loss forecasts are typically the main drivers of future regulatory solvency issues, and thus should be produced by the experts engaged to undertake the AQR. This approach not only ensures prudent and consistent treatment across banks, it can also help provide legal protection to supervisors who need to subsequently intervene in a way that results in bank creditors suffering losses.

Results from stress tests should be considered in conjunction with other diagnostic findings. Taking the results from stress tests as definitive may create the wrong incentives for banks and supervisors, and either generate a sense of complacency or exaggerate the expected losses and capital needs (e.g., at a cyclical low point and an illiquid market). Ideally, stress tests should be preceded by an AQR; as stand-alone exercises, they are unable to challenge the validity of input data. Moreover, stress tests cannot fully consider the nonlinear effects of economic and market shocks on banks.

F. Liquidity

Bank liquidity is another critical factor to assess in the context of IMF programs. While bank diagnostics focus heavily on capital-related issues, liquidity problems usually trigger bank failures. In IMF programs, bank liquidity problems are typically addressed with comprehensive monitoring frameworks, lender-of-last-resort facilities, and bank-level funding plans.

[6] The book, "A Guide to IMF Stress Testing: Methods and Models," International Monetary Fund, 2014, provides an overview of the issue, among other related material.

[7] Supervisory stress tests often apply a static balance sheet approach, which assumes that assets and liabilities that mature within the time horizon of the exercise are replaced with similar financial instruments, and banks maintain the same business mix and model (in terms of geographical range, product strategies and operations) throughout the time horizon.

[8] For a more detailed analysis, see 'Credibility and Crisis Stress Testing,' IMF Working Paper No. 13/178.

IV. COMMUNICATIONS

Good communications are an integral part of any financial sector strategy that uses bank diagnostics. Effective coordination among national authorities is needed before the diagnostic exercise starts to ensure that key issues are defined before informing other stakeholders about the exercise. An intra-agency group comprising senior representatives from the central bank and the government should be formed and made responsible for developing the financial sector strategy; that group should also identify upfront which creditors will bear losses and the modalities of any capital and liquidity support to be provided to banks.

It is necessary to articulate a clear narrative on why the exercise was needed, the approach taken, the findings, and how identified problems will be addressed. When communicating with other stakeholders, the authorities need to "speak with one voice" to avoid conflicting or confusing messages that could undermine financial stability. The communications plan often requires setting up a dedicated team to manage the process, prepare for public disclosure, and deal with media issues. Much of this work can be done in advance of completing the bank diagnostics.

The amount of information publicly released is often dictated by circumstances, but the authorities should aim for maximum disclosure consistent with financial stability. Country authorities do not always have the fiscal space, lender-of-last-resort facilities, resolution capabilities, or political appetite to provide credible capital and liquidity backstops to deal with the gaps found in bank diagnostics. Financial stability concerns may necessarily result in a minimalist approach to disclosure before, during, and after completion of the exercise. However, when credible capital and liquidity backstops are in place, have been communicated to, and are well understood by the public, detailed disclosure of the methodology and bank-specific information and results can have advantages. It allows investors and counterparties to understand the risk profile of each institution and enables market participants to undertake their own analyses. In recent years, European authorities (ECB and European Banking Authority (EBA)) have set high standards in disclosure, with publication of full details of their AQR and stress testing methodologies, and granular information describing the financial condition of each bank.

Supervisors and banks should formalize internal communications channels for a diagnostic. Supervisors should engage banks in regular communication during the exercise to ensure the methodology is applied consistently, key project timelines are adhered to, and public disclosure arrangements are made. This is typically achieved through daily technical discussions with onsite inspectors, weekly management-level update meetings, and development of a Question-and-Answer document shared with all banks. Once initial results have been informally conveyed to banks, communication typically becomes ad hoc, as stakeholders make factual clarifications, assess implications for each institution and the banking system as a whole, and the solutions to be applied.

A consistent strategy for external communications is also needed. This typically starts with the supervisor publishing the methodology and assumptions of the exercise at the start of the process. When supervisors formally communicate results of a diagnostic to an individual bank, they often inform the bank that it is expected to publish disclosures on their website at the time that the supervisor publicly communicates the results.

V. POST-DIAGNOSTIC ACTIONS

When bank diagnostics identify regulatory capital shortfalls, bank recapitalization and restructuring have to follow. Supervisors generally use regulatory solvency as the tool to enforce the findings of a diagnostic on individual banks. Adjustments to asset values result in supervisory expectations of higher losses and, thus, expected upward adjustments to loan-loss provisions and downward adjustments to regulatory capital. In advance of the higher losses being realized (and reflected in the accounting balance sheet), a regulatory adjustment can be made, usually through so-called Pillar II add-ons.[9] Banks are subsequently required to send to the supervisors a capital action plan to address any shortfalls through converting subordinated debt to equity, issuing fresh capital, or deleveraging. Those banks that do not comply with these steps are subject to resolution or, in exceptional circumstances (e.g., when spillovers are high), restructuring with state support.

Public solvency support, if unavoidable, should only be provided under strict conditions that maximize burden sharing, minimize moral hazard, and protect taxpayers. Ideally, state support should only be provided to systemically important banks that are deemed viable, following upfront loss recognition and after losses have been borne by existing shareholders. Supervisors need to identify which banks are systemically important at the point of failure and assess their viability to ensure that the restructured bank can build capital through retained earnings, and thus avoid further reliance on the state. Assessments of systemic importance are based on size, interconnectedness, substitutability, and complexity of the balance sheet and operations. Viability assessments require judgment of business plans provided by the banks, including projections for earnings, liquidity, and capital.

VI. IMPLEMENTATION ISSUES

A. Timing and Costs

Undertaking a bank diagnostic during a Fund-supported program is complicated and, ideally, the bank diagnostic should be started as early as possible. During the initial negotiation, staff should impress on the authorities that a comprehensive diagnostic of the banks' condition will be a necessary precondition of a Fund program. Staff should propose that (i) the diagnostic is finalized before the half-way point of the program; and (ii) the scope, timeline, and the TORs are agreed ex ante. It will also be important to reach agreement on how the diagnostics will be paid for and to establish robust governance and oversight.

Cost considerations are relevant. There are no precise estimates of how much bank diagnostics cost. Depending on circumstances, such as the complexity of the banks and their problems, total costs may be in the range of 2 bps to 7 bps of the total nominal value of the balance sheets under review (see Box 4 for an example). Other relevant factors that affect costs are, among others, the nature of the investigations (e.g., forensic or going-concern), the size of the asset portfolios, sampling requirements, the head-count, and specialization of the staff involved in the review.

[9] Pillar II add-ons capture risks which are not adequately covered by mandatory minimum own funds requirements (known as "Pillar I").

BOX 4. Funding the Irish Bank Diagnostic Exercise and Enhanced Capacity Development

The Central Bank of Ireland (CBI) spent about €31 million (0.7 bps of bank assets) over three and a half years to design and implement the Irish Financial Measures Program. The program aimed at tackling problems in the national banking system that had grown to approximately three times the size of GDP. About one half of the total was spent in the first year, performing the AQR and loan-loss forecasts, including associated data integrity verifications. The other half was spent over 2012–13 on follow-up activities, including: (1) a distressed credit operations review; (2) a Mortgage Arrears Review and Solution program; as well as (3) development of loan-loss forecast models at the CBI for 12 asset classes and implementing a new risk-based supervisory framework (PRISM). The investment made clearly enhanced the overall quality of program implementation and its credibility, including reinforcing the CBI's overall capacity. The subsequent 'comprehensive assessment' diagnostic of the ECB, completed in 2014, cost almost €23 million for the Irish banks.

A 2015 report from the Irish Comptroller and Auditor General states that a total of €152 million (3.5 bps of bank assets) was paid out in consultancy fees related to clean-up of the Irish banking system, to various law firms, accountants, and banking experts by the CBI (€85 million), the National Treasury Management Agency (€41 million), the Department of Finance (€22 million), and the National Pension Reserve Fund.

Phase of stabilization (€m)	2008	2009	2010	2011	2012	2013	2014	Total
Restructuring, recapitalization, and guarantees	6.5	14.2	12.0	18.2	3.4	3.5	1.2	59.0
Financial measures program	–	–	–	28.1	1.6	1.1	0.3	31.1
ECB comprehensive assessment	–	–	–	–	–	–	22.6	22.6
Residential mortgage arrears	–	–	–	0.0	7.0	8.7	1.4	17.1
Other	0.1	6.5	2.7	8.4	1.6	1.8	1.1	22.1
Total costs	6.5	20.7	14.8	54.8	13.5	15.1	26.6	151.9

The Irish banks successfully restructured, regained market access, reduced NPLs to manageable levels and have returned to profitability. Although the state retains ownership in the banks, this experience demonstrates that targeted measures combined with effective implementation justify the upfront costs.

There are several ways to pay for a bank diagnostic:

- Requiring the banks to pay for the exercise is an option. This can be done in connection with the presentation of business plans, for example, or through requiring an expanded (special) audit based on a set of agreed-upon procedures and standards;
- Another option is for the supervisor to pay for the reviews and apply a special one-off levy on the banks concerned to recover costs;
- Another option for low-income countries is to request donors to fund the exercise; or

- Matching a portion of a program loan with an IFI with local government funds for implementation tasks is another possibility.

Cost considerations can influence the quality and credibility of a diagnostic exercise. The depth of a review and the staff that perform it are key drivers of the overall cost envelope. The budget dedicated to paying for bank diagnostics determines the timeliness, quality, and reliability of the exercise. These, and the standing of the firms responsible for the review, influence the credibility of the results. In systemic crises, there is also need for disciplined project management office (PMO) skills: PMO and quality assurance need explicit budget allocations to enhance credibility and oversight.

Costs typically present an additional challenge in convincing country authorities to undertake bank diagnostics. High fees charged by specialist firms or international audit companies increase the challenge. Nonetheless, it is advisable not to let cost minimization criteria become the main driver of the decision. Reducing costs or shortcuts on governance have often led to bad outcomes.

B. Governance of Bank Diagnostics

Independent experts

Third parties (independent of the banks and of their supervisors) should have an active role throughout the diagnostic. Failures in banking supervision and macroprudential policy are important root causes of virtually all banking crises. If emerging problems are tackled early and decisively, banks will be more resilient to shocks and the chances of systemic crisis emerging are therefore lower. Thus, when crises do emerge, the credibility of the supervisor is often in question, and sufficient involvement of third parties, independent of both the banks and the bank supervisors, becomes essential in the execution and the validation of diagnostic reviews (with these two tasks best undertaken by different actors). The objective of including third parties is to provide impartial technical expertise; operational capacity and credibility; and to ensure that the governance of the bank diagnostics is perceived as fair and objective.[10]

Local third-party expertise often needs to be supplemented with external experts. To the extent that local expertise (e.g., audit firms) is not considered independent or credible, it will be desirable to seek external participation (for example, from an international auditing firm with a team or lead partner based in another country) to either undertake the work, or to lead locally undertaken inspections by the authorities or local firms. The involvement of third parties should be designed in a manner that is consistent with the overall robustness of the exercise, including investigation, sample coverage review work, and extensive collateral appraisal. Each third-party vendor should be required to declare at the outset direct and indirect conflicts of interests that may exist. Involvement of foreign firms or partners can substantially increase costs.

Validation also should be undertaken by an independent party that attests to the quality and rigor of the diagnostic exercise. This party would serve in a quality assurance advisory role, providing guidance on (i) methodologies; (ii) sampling techniques; and (iii) oversight of the diagnostic reviews. The validator needs to be

[10] As noted earlier, bank diagnostics as part of IMF-supported programs are not undertaken by Fund staff, but the Fund is involved in the design and monitoring implementation.

closely engaged with the work, with access to information on techniques and results for the different portfolio categories, the credit files, and bank data tapes, among others. Any material issues identified by this advisor would need to be addressed before the results are finalized and acted on.

External parties should be part of a broader governance structure. A good governance structure promotes credibility through transparency and rigorous implementation of applicable guidance. Besides its advisory tasks in setting methodologies and drafting TORs, the external parties provide overall quality assurance of the whole process to the local authorities, the participating banks, and to the IMF and other participating international institutions. This should include providing opinions that in its execution, the diagnostic complies with best practice, the TORs, and with agreed guidance and methodologies. The governance structure set in place, for example in the 2011 IMF program with Portugal, met these criteria (Box 5).

Role of banking supervision

The local authorities also have an important role in bank diagnostics. To expand the coverage of diagnostic reviews and increase the credibility of the exercise, local supervisory resources could be augmented by engaging private contractors. Alternatively, the exercise could be fully outsourced to private contractors. Given the importance of securing local ownership and knowledge, assisted onsite inspections are often the most efficient and viable approach. TORs for the execution phase, including a specific roadmap, should be agreed to guide the process under strong coordination and rigorous oversight.

The participation of local supervisors in the diagnostic enhances ownership and brings local knowledge to bear. The use of independent experts is almost always a matter of discomfort for the country authorities. Paying for those experts tends to be perceived as expensive, and the credibility and technical competence of local supervisors and auditors is implicitly being questioned. If excluded entirely, bank supervisors may not support the outcomes of the exercise, which would undermine the ownership of the whole restructuring program. Except for cases of egregious failures of integrity at the top of supervision, in which case deep institutional reform will probably be part of the IMF-supported program, a bank strategy and its suite of diagnostics are better implemented by counting on the active participation of local supervisors.

Usually banking supervisors are the recipients of the best available financial information and market intelligence on the banks. They are also likely to understand well the weaknesses in local regulations, for example, in accounting and valuation. Local supervisors know the scope of activities of local economic groups, businessmen, and financiers, and how their interests intersect with the banks. They will also have a better understanding of local lending practices, the meaning of corporate information, and commercial law and lien-related issues

A program of assisted inspections provides a good opportunity for external parties to participate in the bank diagnostic. Provided there are reliable resources available, such a program can be used to transfer know-how and build local capacity. Local supervisors can also serve as a sounding board to discuss emerging results and findings, as well as to advocate to government officials and politicians for reform measures based on the diagnostic's results.

BOX 5. Portugal: Governance Structure of the 2011 Special Inspection Program

Management	Role	Composition
Steering Committee	• Take strategic decisions concerning the special inspection program (SIP), in order to ensure the ultimate quality and credibility of the program. • Decide on the need to introduce adjustments and to approve the TORs for the program. • Monitor program implementation.	International experts appointed by: • IMF, European Commission, and ECB. • Banking supervision authorities from National Bank of Belgium, Banque de France and Banco de España. • Other experts designated by Banco de Portugal (BdP).
Program Management Office (PMO)	• Program execution (control, coordination, and monitoring) • Identify all entities involved in the SIP (external providers, banks, etc.) • Ensure the appropriate interconnection between workstreams. • Identify risks and problems, propose and implement mitigation actions and solutions.	• BdP Supervision directors. • BdP internal PMO team and (Boston Consulting Group (BCG) PMO consultants.
Project Management Committee (PMC)	• Weekly follow-up meetings to obtain a transversal perspective view of SIP and to ensure a consistent use of the criteria across Participant Banks (PBs). • Problem solving of issues emerging in multiple PBs.	• Accounting firms' representatives • BdP Project Managers BdP PMO elements
Team Leaders Committee	• Overall progress status concerning clients common to multiple PBs. • Sharing of findings and issues related to clients common to multiple PBs. • Monitor the execution of each PB's program.	• BdP team leaders (elements responsible for each PBs supervision). • BdP Project Managers.
Onsite Teams	• Responsible for BdP's day-to-day activities in each PB. • Support accounting firms' needs to facilitating communication with PBs. • Oversee the development of accounting firms' activities and compliance with the TORs. • Offsite and onsite inspection work.	• BdP supervision onsite team. • External audit firms

Source: Banco de Portugal, "Special Onsite Inspection Program: Final Summary Report," Table 4. December 2011.

Project management

Undertaking an intensive diagnostic of several banks at the same time is a major managerial endeavor. Bank supervisors and other local authorities may not have the resources and expertise to drive the process on time and according to rigorous standards applied uniformly across banks. Diagnostic exercises need to be approached with a disciplined PMO framework. The PMO function should be attributed to a unit of a competent official agency and staffed with professional or certified project managers. In many cases, technical assistance or direct funding from IFIs, or other sources, may be required for a PMO to facilitate effective and efficient program implementation. The recent bank restructuring programs in Ireland and Portugal, for example, followed a disciplined PMO framework (Box 5). If resources are available, placing a resident advisor in the PMO Unit would help oversee the diagnostic.

VII. AN OVERVIEW OF THE INTERNATIONAL EXPERIENCE

Bank diagnostics have been recommended by the Fund and the World Bank since the 1980s. In their involvement in crisis resolution, the staff of the IMF and the World Bank have gained substantial experience of bank diagnostics. As noted earlier (e.g., Box 1), Fund staff have found information provided by bank managers, auditors, and supervisors to be incomplete, unreliable, or inadequate for their purposes. To obtain reasonable assurance of the scope of the banks' financial troubles and to design bank-restructuring programs, the Fund and the Bank have consistently required countries to undertake specialized reviews. A brief overview of this experience is provided here.

A. Emerging Market Crises

Bank diagnostics have been recommended for emerging markets banking systems for more than three decades. They were an essential part of official sector support programs since the 1980s, with TORs tailored to the most pertinent elements of a CAMEL exam for a given environment.[1] This approach was used during the external debt crisis of the 1980s in Latin America; in Mexico in 1994; and, again, in the Asian crisis in 1997. Unfortunately, there is no official record or study that assesses the overall effectiveness of these early bank diagnostics. In general, however, the oversight was complicated due to lack of explicit PMO and dedicated means for quality assurance.

The need for deep bank restructuring during the transition of the Central and Eastern European countries in the mid-1990s gave rise to a new form of bank diagnostic. In these cases, the banks needed substantive operational restructuring as well as recapitalization. The need to re-engineer bank processes, policies, products, and staff became apparent, and a new form of diagnostic was undertaken in parallel to the financial review. This approach was known as "institutional review," due to its focus on the institution's essential governance and control functions and formalized as part of "management contracts."

In this wave of bank diagnostics, the management contracts were often drafted as "regulatory" orders. Issued by the central bank upon approval of an action plan linked to official support or upon approval of a plan, including recapitalization by private owners. The order specified a number of management actions to restructure a bank's operations. Among these actions, the bank committed to undertake a number of diagnostics, including of asset quality, liquidity, IT and systems, business operations, and profitability. Capitalization with public funds was

[1] See U.S. Federal Reserve Board on Commercial Bank Examination Manual 2014.

dependent upon the condition and viability of the bank being cleared by the supervisor. This approach evolved during the Asian crisis through the "business plan" diagnostic model.

By the time of the Asian crisis, the complications posed by bank diagnostics were well understood. These included, among others: (i) public scrutiny and high expectations; (ii) high costs and difficulties in monitoring and quality control; (iii) large inaccuracies in estimations of capital needs; (iv) dependence on accounting criteria; (v) the difference between recapitalization needs and overall financing envelope; (vi) difficulties in valuing assets in unstable economic conditions; and (vii) static, point-in-time estimates of value rather than forward-looking estimates that helped form a view of viability. This led to the adoption of requests for "business plans," a model that had worked well in the Asian crisis (Box 6).

BOX 6. **Bank Diagnostics During the Asian Crisis of the late 1990s**

In **Korea**, the Financial Supervisory Commission (FSC) developed better information on the condition of banks in at least four ways:

Hiring international accounting firms to ***perform diagnostic reviews of the troubled banks***. The focus was on the prospective level of asset losses, as well as other financial and operational problems. This work was performed by the local affiliates of major international firms, supplemented by experts from offices in other countries, especially from the United States. The banks themselves were required to finance the work.

Requiring the ***banks to submit rehabilitation plans*** containing detailed information regarding their prospective financial and operating condition. Progressively improved plans were demanded.

Commissioning a major international firm to perform an industry analysis. This work generated detailed information on the possible evolution of the post-crisis financial system that supported the valuation of financial sector business lines, for example (*the future vision of the desired financial system*).

Commissioning another international firm to develop a ***financial analysis model*** that could incorporate various inputs, including the results of the diagnostic reviews and the industry analysis, and to ***project future profitability and trends in equity capital***, and equity recapitalization needs by bank.

To gain better information on the financial problems of major debtors to the financial system, the FSC also required the larger industrial conglomerates (chaebol) to enter into debt reduction agreements with their banks. These agreements were to provide complete information regarding the liabilities and cash flows of the conglomerates.

In Thailand, the Bank of Thailand (BoT) did not conduct or organize diagnostic reviews of troubled banks. Rather, ***banks were asked to conduct self-diagnostics*** which were then verified by the BoT. The banks also submitted ***business plans*** to the BoT for review. The consequences of the exercise were unexpected in that, even though no outside reviews were conducted, the BoT received sufficient information to justify a decision to liquidate or nationalize some of the banks.

In Indonesia, independent international auditors were engaged to conduct diagnostic reviews of all banks to determine the level of solvency, and to judge the relative costs of resolving each bank through assisted acquisition, merger, or recapitalization and privatization. Banks were asked to prepare ***business plans demonstrating their continued viability***. An international consultant then reviewed these plans using a financial analysis model similar to that employed in Korea.

David Scott, "A Practical Guide to Managing Systemic Financial Crises: A Review of Approaches Taken in Indonesia, the Republic of Korea, and Thailand," 2002.

B. The Euro Area Banking Crisis

The strategies to resolve banking problems during the recent Euro area crisis relied heavily on bank diagnostics. The banks diagnostics undertaken in those cases combined AQRs with loan-loss forecasts to estimate recapitalization needs, with a forward-looking buffer. Compared to the diagnostics undertaken in past cases, these diagnostics intended to improve transparency and rebuild investor confidence through three elements[2]: (i) the ascendance of stress testing as a crisis-management tool and its integration with AQRs; (ii) wider public exposure of the overall exercises; and (iii) much more intensive use of private contractors, reinforced use of PMO, and stronger governance structures that focused on quality assurance.

In addition, the ECB undertook the Comprehensive Assessment (CA) of large Euro Area banks in 2014 (Box 7). Although not part of a Fund-financed assistance program, the assessment is the best recent example of a large-scale diagnostic by a competent authority. It was undertaken ahead of the ECB taking on responsibilities as supervisor under the Single Supervisory Mechanism (SSM). A key public objective of the CA was to enhance transparency and rebuild market confidence. The CA comprised three phases: (i) a risk assessment to decide which portfolios should be scrutinized in detail in each jurisdiction and bank; (ii) an AQR that applied a standard manual[3]; and (iii) stress tests undertaken in cooperation with the EBA. All the relevant details of the exercise were made public in advance, including their respective process and timeline, manuals, and methodologies, and the exercise was preceded by comprehensive public disclosure of results.

[2] See "Diagnostics in Europe: Asset Quality Reviews and Crisis Stress Testing" MCMFC staff, 12/3/2012.

[3] See the ECB Press Release March 11, 2014 and the ECB AQR Phase 2 Manual. The manual drafted by Oliver Wyman sets out good practice and is similar to traditional bank inspection manuals (the U.S. FRB and OCC's manuals are richer and more detailed).

BOX 7. The ECB/SSM Approach

The comprehensive assessment (CA) began in November 2013, with all large European Union banks that would be covered by the SSM undergoing a risk assessment (Phase 1), an AQR referred to as a balance sheet assessment or BSA (Phase 2), and a stress test (Phase 3). The exercise took 12 months to complete. As well as providing the SSM with assurances that the banks that it was undertaking to supervise were adequately capitalized, viable, and were reporting accurate information, the CA aimed to foster transparency and build market confidence. The process, policies, and procedures set out in the manual provided a consistent basis for the dozens of national supervisors and advisory firms to conduct the AQR in a consistent manner.

The BSA manual was developed with the assistant of independent experts which had been hired to assist in the design and PMO for the CA and was heavily influenced by the AQRs that had been undertaken in Ireland and Spain over the previous two years.

- Credit files were sampled based on a "loan tape" provided by each bank which included loan information such as segment (loan type or industrial sector), classification, status, and credit performance data. The data was assessed for reliability. The tapes also included field attributes for each item to enable stratification of portfolios into pools of assets with similar characteristics in order to build the loan samples.
    - The reviews covered 58 percent of credit risk-weighted assets for the 128 banks subject to the comprehensive assessment.[1] The credit file reviews covered all loans, advances, financial leases, and other off-balance sheet items, including letters of credit and other specialized asset finance such as shipping and project finance. Loan sampling was employed given the large volume of data involved. The sample size depended on the portfolio and individual loan characteristics. National competent authority bank teams verified that credit exposures had been classified correctly. Expected future losses were estimated for incorporation into the stress test.
    - Collateral valuation was a key factor. Generally, collateral was revalued for all debtors selected in the sample in cases where a third-party valuation less than a year old was not available. This was carried out by national competent authority bank teams and fed into other blocks of the exercise.
- Findings of the credit file review were extrapolated to the wider portfolio, with the aim of assessing the adequacy of specific provisions. Projections of findings from samples were applied to homogeneous exposures (in line with standard audit guidelines).
- The ECB used a central "challenger model" to challenge the sufficiency and sensitivity of collective provisions. The approach involved a review of the methodology of each bank's collective provision model for adherence to accounting principles. Differences between a bank's estimation and the challenger model provision were analyzed and reconciled.
- The loan-loss forecasts and stress tests performed in conjunction with the BSA provided a reasonable forward-looking view of earnings. Contrary to the IAS 39 standard (which forces accrued interest on impaired loans to be unwound ex post), the instructions for the forecast were to suspend interest service on impaired loans (though interest on forborne loans and NPLs not classified as impaired was included in full).

[1] As risk-weighted assets were relatively low in "core" European countries, and sovereign bonds were excluded, coverage of total assets was substantially lower.

APPENDIX I. BALANCE SHEET ASSESSMENT: ISSUES OF CONCERN

Type	Area	Issue	Possible Impact
Group issues	Out of scope activities	Screen the consolidation perimeter for groups and type of group under review (all key units included).	Losses from assets and liabilities left out of the review scope (insurance, AMCs).
		Unrecorded intra-group guarantees.	Contingent liabilities erode bank capital.
Securities Investment	Direct verification Valuation	Valuation basis of securities not shown on a mark-to-market basis (e.g., ***government securities***).	Additional provisions needed or hidden reserves. Effect of sovereign downgrades.
		Banks transferring securities from trading to held-for investment accounts (or to off balance sheet vehicles) to avoid marking-to-market.	Additional loss to provision.
		Nonperforming or heavily devalued securities being held in unconsolidated subsidiaries or vehicles.	Additional loss to provision.
Placements with Banks	Liquidity	Need to screen placements to see extent of lending by local parents to subsidiaries in jurisdictions under stress.	Liquidity pressure if subsidiaries ("subs") cannot repay parent loans.
		Loans to nonbank financial institutions (subs and third party) need to be broken out. Funding for NPLs transferred to subs may be booked here, as may loans to low quality obligors in leasing and finance companies (or micro-credit).	Liquidity hit if borrowers cannot repay parent loans. Loss put/back to group from (shadow) investment vehicles.
	Valuation	Terms of lending (extended maturity) may be concealing losses in nonbank financial institutions and holding group subsidiaries to which NPLs have been transferred.	Additional loss to provision. ***Look within the holding group*** for investment firms or vehicles (private banking offshore-units).
	Direct verification and Reconciliation	Hidden encumbrance of correspondent and due-from banks accounts (self-loan financing schemes).	Additional loss to provision.
Loans	Valuation	Amounts of classified loans being transferred to unconsolidated subsidiaries or affiliates of owners.	Additional NPLs and losses to provisions on consolidation.
		Rollovers used extensively to conceal impairment: actual levels of refinanced and restructured loans.	Additional NPLs and losses to provision.
		Overdrafts used to rollover unpaid balances.	Additional NPLs kept as current.
		Distortions in provisioning models: (i) forbearance; (ii) cure rates; and (iii) emerging period (Appendix IV).	Additional loss to provision (especially from LTV: costs and time-to-liquidation).
		Grace periods granted on retail mortgages. Mortgages issued with (U.S.-style) reset rates.	Sub-prime loans not yet in default due to payments not started—rates not yet reset.
		Collateral overvaluation when provisioning. LTV should be adjusted to reflect market value and time to foreclosure. Exchange rate fluctuations against loans in foreign currency. Performance of foreign currency loans. Ascertain existence of loan and collateral documentation, including that collateral liens are legally "perfected."	High potential for additional losses once LTV goes beyond 100%. Impact could be particularly severe on home equity loans and speculative real estate.
	Liquidity	Ascertain share of residential mortgages pledged to covered bonds. Default triggers for covered bonds. (This could happen with other collateral provided to third parties, say the central bank).	Forced transfer of good residential mortgages to cover collateral shortfalls on covered bonds. Required provision of cash to cover performance shortfalls. Reduction in

Type	Area	Issue	Possible Impact
			quality assets to secure additional liquidity lines.
	Consolidation	Unrecognized hidden losses in subs' portfolios.	Sub losses reduce parent equity.
	Collateral	Inflated values without PV discount and related costs. Ease of foreclosure, holding periods, etc.	Losses at foreclosure unaccounted for.
	Macro	Impact of slowdown on small- and medium-sized enterprise and retail portfolios. Potential for falling real estate process.	Possible sharp increase in NPLs, additional provisions (loan-loss forecast).
Equity investments	Valuation	Locate investments in subs. Screen if investments were revalued to reflect problems in key foreign markets (potentially in trouble).	Write down of goodwill and investments reduce capital.
Accruals	Profit and loss	Suspension of interest accruals on NPLs: (i) how accounted; (ii) where booked; and (iii) revenue impact.	Write off of receivable, reduction in income and pre-provision profits.
		Earning impact of zero or low yield assets: recapitalization securities (bonds and tax credits), AMC bonds, fixed-margin loans.	Profit and loss flows unable to recover full costs.
Other Assets and off-balance sheet risks	Valuation	Valuation of other real estate owned.	Write down of reposed RE investments.
		Deferred tax assets, goodwill, bad/aged inter-branch items.	Capital impact via charge-offs.
		Location of other real estate (of all types) booked in unconsolidated subs or separated SPVs. Doubtful guarantees and contingencies booked below the line. Letters of credit, unfunded loan commitments, derivative exposure and trading activities	Additional provisions, charge-off.

APPENDIX II. SAMPLING TECHNIQUES AND PRACTICE

Asset quality typically reviews apply three sampling methods: (i) judgmental (non-statistical); (ii) statistical proportional; and (iii) statistical numerical. The overall coverage often targets from 20 percent to 40 percent of the total loan portfolio exposure, including: (i) the quantity, quality, and nature of the population to be reviewed; (ii) the bank's risk management systems; (iii) the bank's appetite for risk; (iv) the net benefits of the different sampling methods; (v) the purpose and objective of the sample; and (vi) resource constraints.

Precision and reliability levels (i.e., statistical assurance) affect the size of samples. For proportional sampling, reasonable precision levels vary from 5 percent to 20 percent, and reliability levels from 80 percent to 95 percent; both in 5 percent intervals. For numerical sampling, common precision levels are 5 percent or 10 percent, and reliability levels of 90 percent or 95 percent.

Judgmental sampling is without statistical measurement. It allows to review an arbitrary percentage (coverage) of a population and identify specific exceptions. However, it cannot statistically relate the results of the sample to the entire population.

Proportional sampling is appropriate when the total amount of the items targeted is relevant to the objective of a procedure and evaluating the quality of a loan portfolio. Proportional sampling is used to discover additional classified loans in commercial loan portfolios. Proportional sampling also is appropriate to test population items for monetary errors or compliance errors statements.

Numerical sampling defines the sample in terms of the number of items. It is used to reveal the presence, or not, of a defined characteristic in a portfolio of items with similar characteristics. Each item in the population has the same probability of selection as any other. The results of numerical sampling are only relevant in terms of the number of errors or exceptions, such as to determine the frequency of errors, exceptions, or another feature of interest, and when the dollar amount of the exception is not considered relevant

Proportional or numerical sampling is adequate to validate internal loan reviews as well as evaluate credit quality compliance with underwriting standards, and accuracy of internal risk rating.

Numerical sampling is adequate to test: (1) the accuracy of management information systems, such as past due, problem loan listing, and insider loans; (2) renewals, deferrals, and extensions for compliance with policy; degree of usage, and accuracy of reporting; (3) score overrides for compliance with policy guidelines and fair lending laws and regulations, documentation, and reasonableness of credit decision; and (4) recently extended loans for compliance with underwriting policy, credit criteria, laws, and regulations.

For example, in its 2014 AQR, the ECB sampling approach was based on statistical techniques minimizing sample size through stratification subject to a low sampling error expected to be less than 5 percent of total post-adjusted provisions, with a level of assurance of at least 90 percent.[1] After deducting high-quality exposures, the ECB mandated a sample selected for each portfolio divided into 49 strata differentiated by size of debtor-level exposure

[1] ECB's Asset Quality Review, Phase 2 Manual. March 2014. Section 3 on Sampling.

and by risk. A sample is selected from each stratum: (1) by exposure buckets set based on the composition of bank's portfolios; and (2) risk buckets set using basic risk indicators available to all banks (e.g., past due).

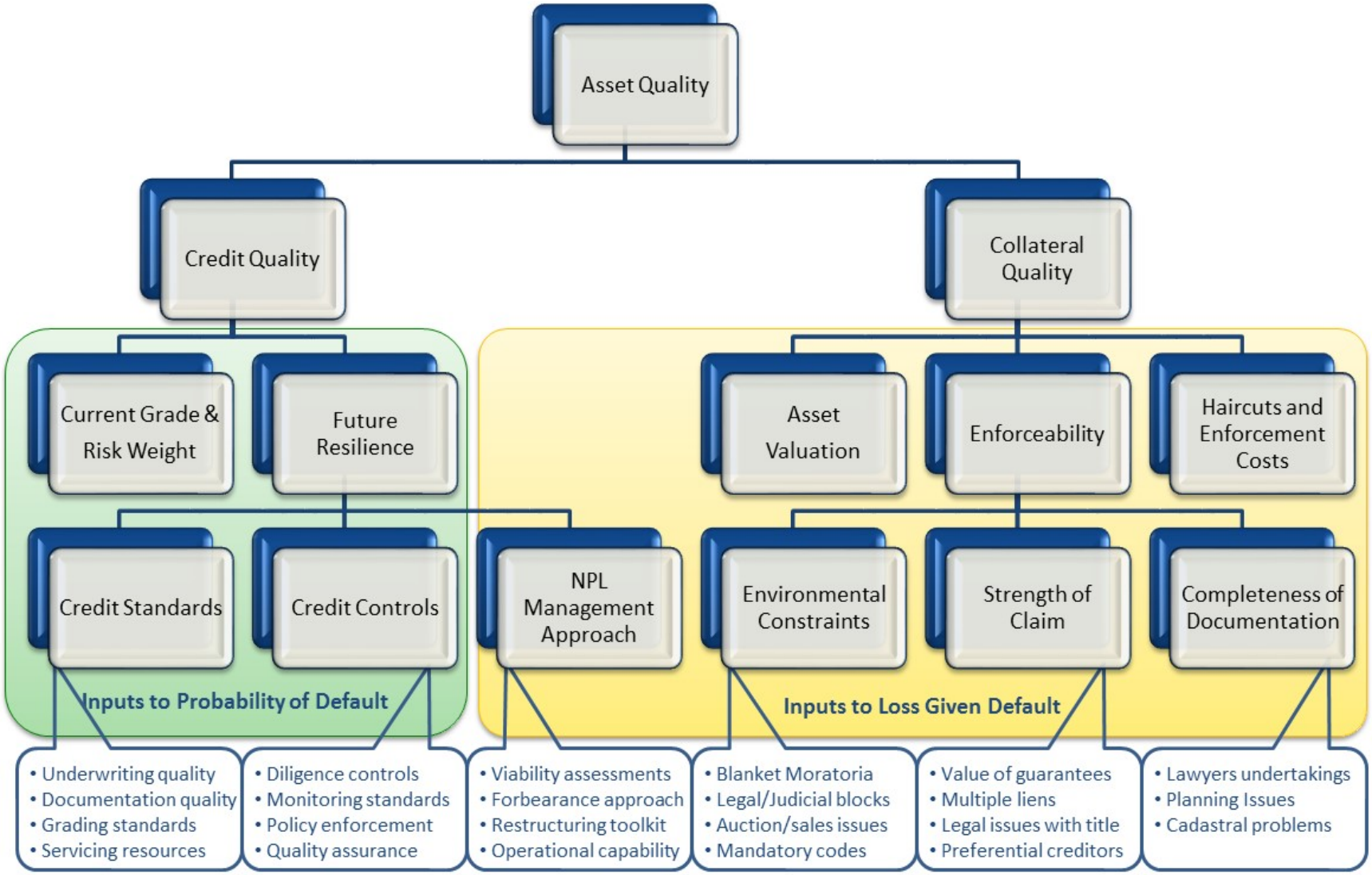
The number of files selected from each stratum is typically set to target a maximum error of 5 percent in post-adjustment provisions at a 90 percent confidence level, assuming a relatively significant (but not extreme) level of adjustment to provisions of around 25 percent. The number of files sampled from each stratum varies, depending on a number of criteria: (1) concentration of portfolio; (2) number of observations in the strata; and (3) riskiness of the strata. In general, the number of files expected to be sampled for each portfolio typically ranges between 250 and 450 files.

Sampling in the 2012 AQR for Spain

Originally planned as a stand-alone AQR, the 2012 bank diagnostic in Spain also included a solvency stress test. This forced increasing the sampling, including random sampling in portfolios. This was not a full balance sheet review; deferred tax assets, security investments, goodwill and exposures to the public sector and other financial institutions were excluded. Key features of Spain's AQR were:

- Limited to *an assessment of **credit risk** only;*
- Included the large exposures in all portfolios;
- Included the 50 largest NPLs (doubtful exposures), the 50 largest new entrants, and the 50 largest existing (reclassified or repaid) exposures in that category;
- Instructions to review at least 500 loan files per bank, but the concept of "group" or "unit of risk" was followed, resulting in the review of much larger number of individual loan files corresponding to obligors linked in groups;
- A total of 117,000 loan files were reviewed for the 17 target banking groups (6,888 files on average);
- Appraisals of collateral for real estate were also sampled, and 1.7 million items were re-based;
- Random sampling was expanded to facilitate the stress tests undertaken by the firm Oliver Wyman, essentially to enable extrapolation of the results of the reclassifications and refinanced loans (to recalibrate PDs and loss given default);
- The Bank of Spain coordinated the AQR and resolved doubts and questions from the auditors; and
- The AQR applied the loan classification criteria set out in the accounting regulations of the Bank of Spain (in Bank of Spain Circular CBE 4/2004);
- ***Random sampling*** took place in residential mortgage and small- and medium-sized enterprise portfolios, done by auditors using "monetary unit sampling";
- The accounting reconciliation of the loan portfolios with the balance sheet and a loan-by-loan data integrity validation of the sampled files were also undertaken.

APPENDIX III. LINKS BETWEEN ASSET QUALITY REVIEWS AND LOAN-LOSS FORECASTING



APPENDIX IV. CLASSIFICATION, PROVISIONING, AND INTEREST SUSPENSION RULE-BASED APPROACH[1]

Class/Criteria	Payment Experience	Industry Trend	Enterprise Position	Financial Condition	Management	Viability Outlook
(1-3) – **PASS** Based on (a) concentrations, (b) level of problem loans, (c) adequacy of credit risk management, and (d) quality of information in files.	• Punctual • High account turnover	• Acceptable • Adequate demand • Adequate profitability • Liberalized industry • Minimal competition	• Above sector average • Strong competitive position • Good products and market	• Profitable (ER) • Liquid (LQ) • Sufficient cash-flow (CF) • Low leverage (LV) • Two repayment sources • Working capital (WC) loans clearly supported	• Capable/qualified • No doubt of integrity • Clear strategic vision • Very professional • Good controls and MIS • Good external audit	• No significant risks
(4) **SPECIAL MENTION** Potential problems	• Delays <90 Days • Occasional overdrafts • High average balances • Medium turnover • Minor contract breach • New loans supported	• Some questions • Income decreasing • Competition increasing • Price competition up • Operating costs up	• Within sector's average • Some competitive weakness	• Profitable • Acceptable liquidity • Moderate leverage • Two repayment sources CF does not cover all operating costs and replacement of assets • Documentation deficiencies (e.g., no original promissory note, security interest not perfected, etc.).	• Capable/qualified • No doubt of integrity • Some strategic problems • Improving control/MIS • Committed owners and managers • Acceptable external audit	• Will survive problems • Has strength to cope • Owners can support • New capital available if needed • No major labor issues
(5) **SUBSTANDARD** Interest suspension and Reversal	• Past due >90 days • Recurrent overdrafts • Low account turnover • Contract breach >90 days • Renewals conceal financial problems • No seasonal cleanup • Weak documentation	• Volatile • Weak Co. under pressure • Income down • Demand down • Liberalization risk • Raw materials risk • Devaluation risk • Administered prices	• Under sector's average • Defined competition problems • Technological weaknesses	• Income low to zero • Low liquidity • High leverage • One repayment source • Weak cash flow • CF < Principal + Interest Increase in WC masks problems • Documentation deficiencies (e.g., no original promissory note,	• Weak, low capacity • Low experience • Integrity in question • No strategic vision • Weak controls/MIS • Governance conflicts • Weak external audit	• Reliant on financing • Owner support uncertain • Requires new marketing • Latent future risks • Minor labor excesses • Basic problem = financial

[1] For further details see: https://www.imf.org/external/pubs/ft/wp/2000/wp00195.pdf, or https://www.openknowledge.worldbank.org/handle/10986/21109 or https://www.bis.org/fsi/publ/insights7.pdf

Class/Criteria	Payment Experience	Industry Trend	Enterprise Position	Financial Condition	Management	Viability Outlook
				• security interest not perfected, etc.)		• Product and markets can recover
(6) – **DOUBTFUL** Interest suspension and reversal	• Past due >180 days • Permanent Overdrafts • Contract breach >180 days • Renewals capitalize interest • Interest charged in overdraft • Poor legal document-ation (loan or claim to collateral)	• Poor • Earnings = or < zero • Acute price competition • High risk of liberalization • Prices down • Operation restructuring required • Politically set prices	• Well below sector average • Serious competition problem • Acute technology problem • Urgent need to modernize • Losing markets • Product problems • Over-extended	• Operational losses • Illiquid • Selling assets to survive • CF < interest service • Excessive leverage • Inadequate payment source • Increased WC hides operational losses • Documentation deficiencies (e.g., no original promissory note, security interest not perfected, etc.)	• Poor—against the wall • Incompetent—hiding • Uncooperative, hostile • Doubts on integrity • Lack of control/MIS • Ownership problem • No source of new capital • Poor external audit	• Operational problems • Major labor excess • Requires debt relief • Deep product restructuring • Deep process restructuring • No full cost recovery
(7) – **LOSS** Interest suspension and reversal	• Past due > 360 days • New loans to finance operational losses • Clearly inadequate evidence of loan or ability to liquidate collateral at predictable value	• Dying • Structural weaknesses • Anachronistic • Liberalization = extinction	• Lower quartile • Can't compete • Obsolete technology • Weak product • Country risk • Marginal role	• High losses • Selling assets at losses • Acute CF & LV problems • CF < operational costs • No identifiable repayment sources (except liquidation) • Documentation deficiencies (e.g., no original promissory note, security interest not perfected, etc.)	• Very poor • Can't be trusted • Incompetent and desperate • Chance of fraud • Nonexistent governance	• Extremely questionable • Should be liquidated • Should be fragmented • Base value on liquidation • Minimal buyers

APPENDIX V. CHALLENGING COLLECTIVE LOAN PROVISIONING INPUTS UNDER IFRS (IAS 39)

Unless local regulation sets a rule-based provisioning standard, bankers in any jurisdiction would argue that they follow IFRS 9 (or another local GAAP). Accordingly, for the purposes of the diagnostic, one must understand well how the different local banks are implementing IFRS 9.

IFRS 9 is a principle-based standard that provides bankers with disproportionate discretion in selecting the model inputs utilized in their provisioning methodologies. This appendix discusses a number of these risk inputs as a reminder of key factors for consideration in the stocktaking to: (1) ascertain the implications of local practice; (2) determine any needs to set criteria for the purposes of the diagnostic in the TORs; and (3) foresee the need for standardizing a local rules-based standard benchmark. In principle, there must be always "actual" empirical loss evidence available to justify the selection of one input value compared to another, such as for "*modeled*" parameters (no actual experience) or "*imported*" from another jurisdiction (say the United States or the United Kingdom).

In a typical collective provisioning algorithm:

$$Provision = Exposure * [1 - (1-PD)^{EP} * (1-CR) * LGL.$$

PD is the probability of default. This algorithm applies to both performing ($PD<1$), and nonperforming loans ($PD=1$). *EP* is the emergence period used to estimate an *Incurred but Not Reported* provision for loans that defaulted but have not still been identified as such. CR is the cure rate, the proportion of loans that default but then return to performing status, as per observed number of cases.

The loss-given-loss for loans backed by real estate collateral is:

$$LGL = C * (1-PTT + Current\_REPI) * (1 - FSD) * DF * (1 - WOC).$$

C is the collateral value when the loan was originated; PTT is the forecast peak-to-through (negative) variation in the collateral price since loan origination; REPI is the current relevant Real Estate Price Index; FSD is the fire sale discount; DF is the time discount value; and WOC are the work-out-costs to cash recovery.

For the purpose of a diagnostic, these inputs must be conservative, justifiable and consistent with macroeconomic forecasts. If *modeled* or *imported*, the right thing to do would be to (1) use a benchmark combination that fulfills the three conditions (say fourth quartile in the system); or (2) set rule-based parameters for those banks that do not fulfill the three conditions, because they *do not have empirical loss evidence with actual sufficient observations properly back-tested*. This is the essence of the ECB "challenger" approach as described in its AQR Manual 2014.

The sensitivity of the overall provisioning estimates to a simultaneous change of the eight parameters may shift up the loss figure significantly, whether under the "Expected Credit Loss" model of IFRS 9, or under an "Incurred but Not Reported" loan-loss provisioning standard that some local banks may still be using to implement generic provisioning. A few tenets for AQR diagnostics follow as reminders of key aspects to clarify as part of the corresponding TORs (significant deviation from this guidance in draft TORs warrants correction).

- The estimation of the risk inputs needs to segregate forborne, refinanced, and restructured loans from the relevant loan pools to calculate separately their values from those of fully performing loans (specially for PD and CR).

- Among several possible stratification variables (LTV, days in arrears, internal rating, among others), a key attribute should be whether or not the client is able to serve a fully interest income from its own resources.

- The emergence period (EP) should be based on an assessment of the effectives and reliability of internal credit controls (especially the internal loan review function). An EP of 12 months may be seen as conservative, IFRS compatible, as it approximates a one-year expected loss for non-defaulted loans. However, if the cycle of internal loan review is higher than a year or seen as not effective and/or non-reliable, the EP could increase above 12 months to account for hidden potential losses (as part of the loan-loss provisioning review).

- Cure rates (CR) input where false cures from re-aging and refinancing must be filtered ex ante. If modeled, there must be sufficient observations of economically reasonable explanatory variables. A key tenet is to condition the declaration of cure to a period of sustained performance, say, full service of interest due for 24 months with a 10 percent to 20 percent reduction in principal through continued debt service.

- If there are doubts about the FSD and WOC, these should be set to provide a conservative rule-based haircut discount. Short of having a justifiable estimation, these parameters should be set at the 50 percent to 30 percent level.

- The discount factor (DF*)* is dependent on the time-to-liquidation (TTL) that, in countries with protracted judicial procedures, may exceed six years on average. The TTL should be set to fully phase out collateral in about five years from the date of the first 90 days past due to account for reduced effectiveness of eligible collaterals.

- The discount rate should ideally be the effective loan interest rate as required under accounting rules. At a minimum, the discount rate should not be lower than the average cost of funds of the marginal source of funding.

TNM/19/04

International Monetary Fund
Monetary and Capital Markets
Department
700 19th Street NW Washington, DC 20431 USA
Tel: 1-202-623-8554
Fax: 1-202-623-6073