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January 21, 2009

To: Members of the Executive Board

From: The Acting Secretary

Subject: **The Fund-FSF Early Warning Exercise—Proposed Procedure**

The attached paper on the proposed procedure for the Fund-FSF early warning exercise will be discussed in a Board seminar that is tentatively scheduled for **Wednesday, February 4, 2009**. Issues for discussion appear on page 13.

It is not intended that this paper will be published on the Fund's external website.

Questions may be referred to Mr. Bayoumi, SPR (ext. 36333), Mr. Brockmeijer, MCM (ext. 38551), and Mr. Ostry, RES (ext. 37405).

This document will shortly be posted on the extranet, a secure website for Executive Directors and member country authorities.

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The Fund-FSF Early Warning Exercise: Proposed Procedure

Prepared by the Monetary and Capital Markets Department,
the Research Department, and the Strategy, Policy, and Review Department

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January 21, 2008

EXECUTIVE SUMMARY

- The envisaged Early Warning Exercise (EWE) is a recurrent process for *integrating* macro-financial and regulatory perspectives, *identifying* and *prioritizing* systemic macrofinancial risks, *proposing* policy responses, and *reporting* to policymakers.
- The EWE will be timed to provide a regular input for the deliberations of the IMFC during the Annual and Spring Meetings, preceded by a presentation to the Board.
- To provide an integrated perspective, the Fund and FSF will cooperate closely, with the Fund taking the lead on macrofinancial concerns and the FSF on underlying regulatory challenges. Confidentiality of information provided to either body will be preserved.
- Differentiating vulnerabilities from benign trends requires many tools and perspectives. Inputs will include quantitative analyses, such as the staff's Vulnerability Exercise and crisis models. But qualitative insights from internal and external sources will also be important.
- An Early Warning Group consisting of staff from several departments will identify principal risks and vulnerabilities, ranking them by their systemic importance, based on expected likelihood and potential impact. For the top concerns, the group will suggest policy responses and propose work agendas to drill down on issues where policy solutions are not apparent.
- The group will present a draft Early Warning List and associated work agenda to the Fund's Surveillance Committee, headed by management, and the FSF Chairman. Once the list has been finalized, the outcome of this work agenda will provide inputs into subsequent EWEs.
- The results of the EWE will be communicated to the Board, the IMFC and, with suitable modification, to the public. Information will be presented to the Board and IMFC in a WEMD-like fashion (no written reports), while broader findings will be disseminated primarily through the WEO and GFSR, as well as individual Article IV consultation reports.
- Staff costs for the EWS and Vulnerability Exercise for Advanced Countries are assessed at around 7-8 staff years permanently, plus an initial set-up costs of 3-4 staff years.

Contents **Page**

I. Introduction

1. **As in earlier crises, the recent financial and economic turmoil could reverse years of progress in raising living standards around the globe**. Free and open financial markets have been shown to confer significant benefits in terms of economic growth, risk sharing, and economic efficiency. However, technological change, financial innovation, or other structural trends can lead to the buildup of vulnerabilities that, unless policy makers intervene, will unwind in a disorderly fashion. By undermining the trust in counterparties and policy makers, financial crises, deep recessions, deflation, or rapid inflation can create lasting damage even to advanced economies, often spilling over into markets or regions that were initially thought to be unconnected to the initial crisis.

2. **To avoid such crises, and to support global macrofinancial stability, the Fund and FSF have agreed to conduct joint early warning exercises (EWEs)**.[1] By effectively integrating the Fund's strength in macrofinancial analysis with the FSF's regulatory insights and focus on immediate and latent financial risks in major financial markets, EWEs will allow a more integrated and comprehensive view of emerging global developments. It will thus strengthen the Fund's capacity to fulfill its core mandate—promoting a stable international financial environment through surveillance and lending.[2] The EWE can also contribute to more effective surveillance and crisis prevention by facilitating a more risk-based allocation of the two organizations' resources.

3. **This paper sets out the staff's views of how periodic Early Warning Exercises could be conducted**. The exercise is timed to provide a regular input for the deliberations of the IMFC during the Annual and Spring Meetings, preceded by a presentation to the IMF Board. This paper will discuss the process, output, and communication of the planned exercise; the respective roles of the Fund and FSF; and the relation of EWEs to other surveillance activities.

II. What Should an Early Warning Exercise Accomplish?

4. **A crisis is generally brought about by macroeconomic, financial, or other shocks interacting with underlying economic or financial vulnerabilities**. The *shocks* could reflect unforeseen events or realization of existing risks. Underlying *vulnerabilities* amplify the impact of shocks and may limit an economy's capacity to adjust, including through policy measures, thus propagating shocks through the wider economy and financial system. An increase in systemic risk may occur as a result of a higher crisis probability, or a higher cost of the crisis due to high underlying vulnerabilities. For example, an increase in house

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[1] Joint Letter by the Managing Director and the Chairman of the FSF issued ahead of the G20 Leaders' Summit on Financial Markets and the World Economy in Washington, D.C. (November 13, 2008).

[2] The Fund is a member of the FSF, and both organizations have cooperated well in the past (see, e.g., "The Fund's Response to the 2007-08 Financial Crisis: Stocktaking and Collaboration with the FSF," SM/08/302).

prices above their "fundamental" level increases the risk of a housing bust (the shock), while high financial leverage (the underlying vulnerability) by households and banks increases the likelihood that the shock will have adverse real effects.[3]

5. **On the other hand, underlying vulnerabilities need not necessarily lead to a crisis**. Macro-financial shocks can also occur with limited economic impact (the 1987 stock market crash, the 9/11 terrorist attack); and macroeconomic vulnerabilities can resolve themselves without a recession (fiscal consolidation in the United States in the 1990s and in the euro zone in the 2000s).

6. **Accordingly, a global early warning exercise needs to not only identify systemic risks and vulnerabilities but also prioritize them to influence policy discussions**. To provide actionable information to policy makers, it is essential to identify and connect the dots among the plethora of potential concerns across sectors, thereby identifying the trends that have the potential or likelihood to inflict the most serious damage. Moreover, it is not sufficient to state general concerns about an issue (e.g., the subprime mortgage market); instead, it is important to drill down to the point where the risk or vulnerability is better identified and potential antidotes can be developed (e.g., capital provisions for Structured Investment Vehicles that were purportedly off banks' balance sheets).

7. **Indeed, a second and equally important element of an effective early warning exercise is to provide policy makers with options to mitigate risks and vulnerabilities**. Of course, implementing such policies will often involve foregoing current benefits. It is for policy makers to determine when remedial action is appropriate, but the EWE can play an important role by highlighting the potential costs of inaction. In this, the EWE's global reach is crucial both because of spillovers across countries, and because some countries may have problems in dealing with risks on their own (e.g., in case of large capital inflows driven by carry trades). To assist in policy formulation, the EWE's key messages will need to be communicated in a clear and candid way.

8. **Realistically, however, no early warning exercise is likely to constitute a fail-safe crisis prediction device**. Crises are fundamentally unpredictable, and attempting to anticipate when a specific underlying vulnerability or trend will erupt into a full-blown crisis (as a result of some shock) is unlikely to be a productive endeavor. However, "flag-raising," that is, identifying trends that leave markets, countries, and regions vulnerable to unanticipated events, is both feasible and central to effective surveillance. Raising red or yellow flags about such underlying vulnerabilities or trends is indeed likely to be a key output of the EWE.

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[3] Risks and vulnerabilities may be different aspects of the same problem. For example, high financial leverage may have contributed to a housing bubble in the first place.

9. **Of course, the design of the early warning exercise also needs to take into account that repeated unspecified warnings lead to risk fatigue and inaction**. Many vulnerabilities are by their nature slow to build up (e.g., credit and housing booms) or difficult to identify (e.g., the nature of cross-border spillovers), and there is a legitimate concern about "crying wolf" too often. However, a disciplined approach that over time looks at a problem from different angles and drills down to the underlying issues stands a chance of being taken seriously by policy makers, especially if it facilitates the development of specific policy recommendations. Thus, a key focus of the EWE should be on the possible impact of risks and vulnerabilities, and appropriate policy responses to mitigate such impact. When the answers are not clear cut, the EWE will propose areas in need of further analysis.

III. How Could an Early Warning Exercise Be Conducted?

10. **An effective EWE will depend on combining a wide range of tools and perspectives**. Both quantitative and qualitative approaches have been employed with some success inside and outside the Fund in recent years (Box 1). Indeed, a major aspect of the EWE involves consolidating such quantitative work with crucial qualitative insights gleaned from many different sources in a systematic way.[4]

11. **The proposed exercise involves a recurrent process of canvassing concerns, distilling and prioritizing problems, identifying policy responses, and reporting** (Figure 1). To ensure a wide-ranging perspective, Fund staff and the FSF will cooperate closely on each of these steps, with the Fund staff taking the lead on macrofinancial concerns and the FSF focusing more on underlying regulatory challenges (see Section IV). An accompanying work program will be established to drill down on the "known unknowns," that is, issues where more information or analysis is needed to arrive at specific policy responses. Results of the work program will provide input for subsequent EWEs.

12. **The exercise would naturally adapt as experience is gained in the initial EWE rounds**. Staff is keenly aware of the complexities in setting up an EWE, involving two distinct bodies cooperating in largely uncharted territory, with possibly significant risks to their reputation. The structure laid out in this section should thus be seen as a starting point, and staff is prepared to make pragmatic adjustments as the EWE goes through its first rounds. A dry run will be conducted in the spring of 2009, with the first full exercise launched for the 2009 Annual Meetings in Istanbul.

13. **Developing additional quantitative tools to assess risks and vulnerabilities and evaluate domestic and cross-border macrofinancial linkages, remains key**. The Fund is

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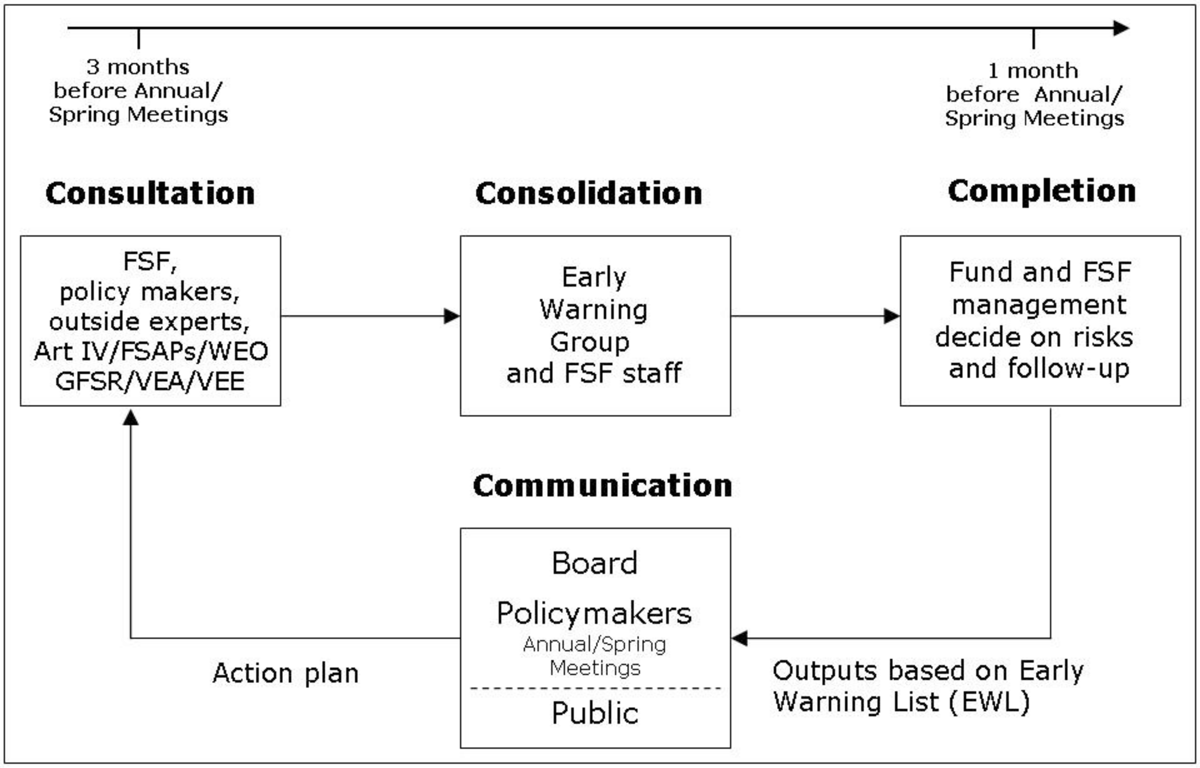
[4] The need for systematic approaches to prioritizing the Fund's surveillance work was emphasized in the "Report of the Taskforce on Integrating Finance and Financial Sector Analysis into Article IV Surveillance" (February, 2007; SM/07/57), which also considered management engagement in such interdepartmental exercises to be of critical importance.

Figure 1. The EWE Process



already devoting significant resources to work on financial sector issues and macrofinancial linkages, and the revamped methodology for the VEE and emerging methodology for the VEA represent initial contributions (Boxes 2 and 3). Nevertheless, further work will be needed to improve analytical tools for the prioritization of risks by assessing, e.g., negative feedback loops between financial markets and the real sector or the potential for second-round effects within the financial sector and due to cross-border exposures. This will also require collecting additional data on balance sheets, financial flows, and cross-border (bank and nonbank) exposures to measure systemic risk on a global scale.

Information gathering and consultation

14. **At the outset of each EWE round, Fund staff and the FSF would discuss sources of risks and vulnerabilities that could lead to regional or global systemic crises**. The initial round would be akin to a stocktaking exercise, whereas subsequent rounds would also include a follow-up on earlier issues. This could include a review of outputs commissioned in previous EWEs, updates to assessments and economic and financial conditions from the previous round that might warrant a different set of policies.

15. **In parallel, a wide range of external sources would be consulted for their views on potential systemic concerns**. These include policy makers, market participants, and financial sector analysts and academics. To foster out-of-the-box thinking, it will be important to also canvas the insights of analysts whose views differ from the consensus.

16. **The results of external consultations will be combined with internal analysis**. Area and functional departments would provide a list of the most pertinent concerns in their regions/sectors, based on their bilateral and regional surveillance activities. Other inputs will be drawn from multilateral surveillance work (e.g., risk studies around the WEO forecast), analysis of financial market conditions, and fiscal trends. In addition, the VEE/VEA will provide important quantitative inputs into the EWE rounds.

Consolidation and completion

17. **The distillation of risks, vulnerabilities, and trends into a comprehensive information set will be done by the Early Warning Group (EWG)**. The group, comprising a limited number of staff from relevant departments, will consolidate the inputs received during the consultation process. It will classify the inputs into three categories—short-term risks, underlying vulnerabilities, and emerging trends—and highlight specific areas that are of high, moderate, or lesser concern, and areas where the extent of concern cannot be gauged based on the information at hand. The group will coordinate with other departments, and it will be guided by ongoing work on spillovers and macrofinancial linkages.

18. **Based on the above, the group will submit a draft Early Warning List (EWL), a shortlist of risks and vulnerabilities, to management and the Chairman of the FSF**. For items on the shortlist, the EWG in conjunction with the FSF secretariat will provide either: (a) policy actions to mitigate risks and reduce vulnerabilities, where concerns are well understood; or (b) suggestions for further analysis ("drilling down") in order to arrive at policy options at a subsequent Early Warning Exercise.

19. **The EWL would be approved jointly by Management and the Chairman of the FSF**. On the part of the Fund, the EWL would be discussed in a Surveillance Committee meeting, and management and the Chairman of the FSF would subsequently finalize the list. The process of reaching agreement will be facilitated by the envisaged close cooperation between Fund staff and the FSF secretariat in the compilation of the draft EWL.

Communication

20. **The Board would be informed of the outcome of the EWE through a restricted, informal presentation by Management**. The WEMD-like presentation will obviously include some discussion of the top risks and vulnerabilities, and how they might interact in generating a crisis. However, to ensure its relevance to policy makers, a strong focus will be on the recommendations for policy action and the need to conduct further analysis on the "known unknowns." As has been typical for such presentations, the focus will be on systemic issues rather than vulnerable countries, and references to individual financial institutions will generally be avoided.

21. **The presentation to the Board may also include selected topics or case studies that could be presented in greater detail**. Many of the risks contained in the EWL are likely to be related to each other, and staff will conduct topical analysis to "connect the dots" and focus on risk clusters in greater detail.[5] The outcome of this analysis will be included in the presentation, thereby focusing on possible contagion and common solutions and placing extra emphasis on the staff's policy recommendations.

22. **This would be followed by presentations to the IMFC and other official forums, with the level of detail depending on the nature and interests of the audience**. Given the nature of the Exercise, these presentations would be joint with the FSF. While not part of the EWE *per se*, the follow-up on earlier policy recommendations could be an important part of the discussion with policymakers.

23. **Public dissemination of the EWE findings would occur through existing conduits**. The timetable of the exercise allows for its initial findings, if not the final version of the EWL, to be reflected in the discussion of risks in the concurrent versions of the WEO and GFSR, as well as subsequent REOs and Article IV reports. Staff will consider options to adjust the presentation of risks in the WEO and GFSR so that the systematic work underlying the EWE is reflected in a substantive way.

24. **In the staff's view, preparing a separate public report on the EWE would not be an efficient use of scarce resources**. Given the need for confidentiality, a joint Fund-FSF report would add relatively little to the (EWE-augmented) discussion of risks in the WEO and GFSR. Moreover, preparation of a joint report could make the EWE significantly more resource-intensive, given the need for two different organizations to agree on a complex draft within a fairly tight time frame.

IV. How Will the Fund Engage With the FSF?

25. **Fund staff and the FSF secretariat have had preliminary discussions of the forms of collaboration between the two organizations**. This has led to an agreement on the broad scope and timeline for the EWE, but procedural details for mutual consultations and exchange of information have yet to be worked out. Given the different setup of the two bodies—the Fund as an international financial institution with a wide membership and the FSF as a forum of national regulators, central banks, fiscal authorities, and international standard setters in major financial markets with a small secretariat—agreed procedural details will naturally reflect different internal decision-making processes at each organization and are likely to evolve over time.

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[5] For example, the underlying factors and systemic implications of financial vulnerabilities in some Eastern European countries could have been the subject of an EWE presentation in 2008.

26. **It is expected that the FSF's initial input for the EWE will be largely based on submissions by its members**. The EWE's initial phase is to coincide broadly with meetings of the FSF's Vulnerability Group, which has been a forum for FSF members to discuss financial sector risks. Risks and vulnerabilities identified during these meetings would be conveyed by participating Fund staff to the EWG. Other FSF inputs could include the lessons from its Financial Stability Reports prepared by its members, as well as the outcome of the work program agreed during previous EWEs.[6] The staff understands that such projects would most likely be carried out by FSF members, with the secretariat playing largely a coordinating role.

27. **A key issue yet to be determined is how the FSF would provide feedback during the distillation of risks and the compilation of the Early Warning List**. On the one hand, the FSF, with its decentralized structure, may require significant lead time to develop a consensus among members on how to react to suggestions by Fund staff. On the other hand, there are several steps in the process where feedback from the FSF will be sought, and a relatively quick turnaround would be needed to keep the overall exercise within the allotted timeframe of about 2-3 months. In this context, questions might also arise whether Fund staff should receive input directly from members of the FSF, or whether contacts should be primarily through the FSF secretariat.

28. **Developing a clear sense of the limits on the amount of data and information shared between the two bodies will also be critical**. Members of the FSF are prevented from sharing confidential data gained in the process of regulatory oversight. On the side of the Fund, country-specific results of the VEE (and, in future, VEA) are shared neither with the Board nor outside the staff for reasons of confidentiality and market sensitivity, and the privileged nature of interactions with members, for example, during Article IV consultations or FSAPs, will also need to be protected.

29. **At least initially, staff suggests that communication between the FSF and the Fund should focus more on risk assessments, and less on the underlying data**. Given the delineation of tasks established between the Fund and the FSF, there appears no need to exchange detailed information to determine, for example, the vulnerability of a given country to an external shock (which would be in the responsibility of the Fund) or the business exposures of particular financial institutions (the FSF's remit). However, being tasked to arrive at a common understanding of *systemic* risks and vulnerabilities, the two bodies will have to exchange information enabling them to judge the potential for macrofinancial shocks and cross-border spillovers. This will have to be done in such a way that the confidentiality of information provided to either organization is preserved.

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[6] This will only apply from the beginning of the second EWE round.

V. What Will Be in the Early Warning List?

30. **This section discusses the information set established in the initial phase of the EWE, as well as the process of arriving at a draft Early Warning List** (Table 1).[7] The set will be compiled from input received both externally and internally, with the risks and vulnerabilities organized using several criteria, including type of risk or vulnerability, economic sector, and geographic location.

31. **The information set makes a distinction between short-term risks, underlying vulnerabilities, and emerging trends:**

- *Short-term risks* include specific events (with potentially adverse consequences) that may occur in the next 12 months.
- *Underlying vulnerabilities* include weaknesses in economic or financial fundamentals, or the institutional or regulatory framework, that would expose an economy to risks and amplify the impact of a shock, should it occur. As such, underlying vulnerabilities can be viewed as necessary but not sufficient conditions for a crisis. Since crises are often triggered by some type of shock—economic, financial or political—it is a combination of shock(s) with the underlying vulnerabilities that tends to result in crises.
- *Emerging trends* include economic or financial developments, or changes in the institutional or regulatory framework, that can potentially give rise to vulnerabilities and are worth monitoring.

32. **Within the three categories, items are further sorted into two broad "buckets," depending on whether their flavor is more *institutional/regulatory* or *macrofinancial*.** The first bucket typically includes risks and vulnerabilities more in the FSF's domain, such as the emergence of new financial instruments or risk-management practices that can potentially generate future vulnerabilities. Items in the second bucket would generally include events or developments more in the Fund's domain, such as "sudden stops" in capital flows, unsustainable saving-investment imbalances or fiscal positions, or credit and asset price booms. However, there will inevitably be much overlap between the two buckets, and one of the purposes of the exercise is to effectively integrate the two perspectives. Hence, the categories are not intended to define a sharp division of tasks between the two bodies.

33. **The Early Warning Group would rank items in terms of their *likelihood* (for risks) and *potential systemic impact*.** The assessed impact would correspond to a scenario under which a given shock has a reasonable chance of both occurring and interacting with a

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[7] Table 1 provides an example of how the EWL might have looked shortly before the onset of the subprime crisis, benefiting from hindsight. The table is intended to demonstrate the structure of the EWL, not a claim that the EWE could have anticipated the current crisis in all its detail.

Table 1. What Might Have Been on an Early Warning List Before the Subprime Crisis?

January 2007

1	Short-term risks	Likeli-hood	Impact	Policy options/Further analysis
1.1	**Largely institutional or regulatory**			
1.1.1	Bankruptcy of a major financial institution with significant cross-border spillovers.	**L**	**H**	Define possible modalities of a rescue plan, prepare cross-border resolution framework.
1.2	**Largely macrofinancial**			
1.2.1	A significant decline in house prices in several advanced countries.	**M**	**H**	Assess impact on banks (real-estate specific stress tests); identify measures to support households.
1.2.2	A rise in delinquencies in the subprime mortgage segment and a broader range of mortgage instruments.	**M**	**M**	Assess impact on banks; identify measures to support households, design/clarify the loan workout procedures to limit foreclosures.
1.2.3	A balance of payments crisis in one/several of the Eastern European countries. Most vulnerable countries include [country names].	**M**	**M**	Prepare for potential Fund programs; analyze potential for contagion to other EM countries in the region and beyond.
1.2.4	A rise in the banks' funding costs due to a squeeze in the ABCP and interbank markets	**L**	**H**	Enhance stress-testing for funding liquidity risk. Consider ways to strengthen the central banks' liquidity frameworks.
1.2.5	Weakening U.S. and global growth triggers rapid unwinding of commodity bubble and a rise in volatility.	**L**	**H**	Prepare active use of macroeconomic policy tools, including fiscal stimulus where feasible.
1.2.6	Disorderly unwinding of global imbalances.	**L**	**H**	Assess the potential for volatility in markets; implement recommendations of multilateral consultation.
1.2.7	Problems in Eastern Europe spreading to banks in advanced countries exposed to the region. Countries with most vulnerable banks include [country names].	**L**	**M**	Analyze regional exposures and potential losses of major financial institutions in [country names]; policy options to address capital shortfall.
2	**Underlying vulnerabilities**		Impact	**Policy options/Further analysis**
2.1	**Largely institutional or regulatory**			
2.1.1	Rising leverage in the financial system (including through structured products, where it is hard to measure).		**H**	Assess the potential impact of rapid deleveraging of risk in banking systems in advanced countries. Encourage use of countercyclical risk management models; strengthen oversight of internal risk controls.
2.1.2	Loosening in lending standards in credit markets.		**H**	Tighten lending standards and reexamine consumer protection.
2.1.3	Increasing use of SIVs by internationally active banks, with explicit or implicit credit support from sponsors.		**U**	Raise capital charges on SIVs; review data provision requirements.
2.1.4	Weaknesses in cross-border bank resolution frameworks complicate intervention in large complex financial institutions.		**U**	Develop options for closer collaboration of regulators; develop concepts for burden sharing.
2.2	**Largely macrofinancial**			
2.2.1	Rapid unwinding of global current account imbalances poses risks to economic and financial stability.		**H**	Implement policy commitments agreed during first IMF Multilateral Consultation.
2.2.2	Continued growth of bank credit to households in advanced and emerging economies. Countries with high household indebtedness and rapid growth include [country names].		**H**	Raise capital requirements using stress tests of housing bust; improve consumer protection/education.
2.2.3	Boom in foreign-currency lending to households in [country names]		**M**	Review the appropriateness of the exchange rate regime; raise risk weights on unhedged foreign-currency loans; prioritize FSAP Updates.
2.2.4	Increased importance of hedge funds in providing liquidity in many asset markets.		**U**	Assess the extent of hedge funds' participation and possible impact of their withdrawal.
3	**Emerging trends**			**Policy options/Further analysis**
3.1	**Largely institutional or regulatory**			
3.1.1	Increasing reliance on similar risk-management models by major banks.			Analyze potential consequences for financial institutions and markets.
3.2	**Largely macrofinancial**			
3.2.1	Increasing tightness in global oil reserves could trigger additional price spikes.			Obtain better understanding of oil price developments; identify options to smooth supply-demand adjustments.
3.2.2	Rapid increases in opaque OTC exposures by systemic banks.			Provide suggestions for creating a central platform; ensure issuers are regulated.

Notes: *Short-term risk* refers to specific events (with potentially adverse consequences) that may occur in the next 12 months; u*nderlying vulnerabilities* affect either the likelihood of distress or the impact of a given shock; *emerging trends* could give rise to vulnerabilities and are worth monitoring. "*Likelihood*" refers to the next 12 months; "*Impact*" refers to potential systemic losses. "H"=high; "M"=medium; "L"=low and "U"=unknown. Due to confidentiality and market sensitivity concerns, this list would not have been circulated to the Board.

vulnerability, thus leading into a crisis. The ranking will be partly based on quantitative inputs—including the results of the VEE/VEA—as well as the history of past crises, scenario analyses, and model simulations, where available. However, the final ranking ("High, Medium, or Low")—which represents a summary measure of the degree of concern about the item on the EWL—will necessarily involve judgment.[8] In cases where either the likelihood or the impact cannot be gauged from the available information, the degree of concern will be assessed as "Unknown," warranting further analysis.

34. **The identification of policy responses to risks on the EWL will be guided by further consultation with area departments**. Responses will be adapted from policies recommended in the course of multilateral/bilateral surveillance or in discussions with the FSF and other departments.

35. **The EWL also carries a work agenda**. In cases where further analysis is needed for ranking either the likelihood or impact of a particular event, or for identifying a suitable policy response, the EWG will provide suggestions for further information gathering and analysis. The FSF would generally be expected to lead on the elaboration of institutional or regulatory policy responses, and the Fund on macrofinancial surveillance. The joint work plan will provide inputs for subsequent EWE cycles and help in optimizing the allocation of scarce resources for risk analysis.

VI. How Does the EWE Relate to Other Surveillance Activities?

36. **The EWE draws primarily on resources from MCM, RES, SPR, and FAD (for fiscal issues), and the exercise will be fully integrated into the Fund's surveillance work**. Area departments will be involved in all stages of the EWE, from initial consultations through the finalization of the EWL to the implementation of the work agenda. They will also provide critical input for the VEA and VEE, and play a key role both in contributing regional risk assessments and in communicating the results of the EWE back to member countries through Article IV consultations and REOs.[9]

37. **There would be a close relation between the EWE and other multilateral surveillance vehicles**. The proposed timeline of the EWE has been coordinated with those for the WEO and GFSR to allow for a continuous exchange of information in the run-up to the Annual and Spring Meetings. Most of the analytical work conducted in the preparation of

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[8] The categories "High, Medium, and Low" are not associated with specific numerical values. It is therefore likely that many risks and vulnerabilities will receive similar rankings. In such cases, and when comparing high likelihood/small impact events with small likelihood/high impact events, the EWG will seek further input from the FSF and other departments in arriving at its judgment. Staff is also working on models to quantify crisis probabilities and costs of crises in the context of the VEE/VEA.

[9] The results of the EWE would help area departments strengthen the discussions of risks, spillovers, and macrofinancial linkages in Article IV consultations, as discussed in the Triennial Surveillance Review.

the WEO and GFSR will naturally flow into the EWE's risk assessments and vice versa, as the two reports will be the primary means of reporting the EWE's results to the wider public.

38. **The EWE could bring additional focus to the Fund's surveillance operations**. Having agreed on the prioritization of risks and vulnerabilities on a global scale, the Surveillance Committee appears to be a natural forum for discussing how the Fund's limited resources could best be concentrated to drill down on the "known unknowns." Among other options, available tools include special country missions, FSAP Updates, intra-departmental task forces, or specific GFSR and WEO projects.

39. **The EWE's integration with other surveillance activities and the collaboration with the FSF suggest that the exercise will require some additional resources**. The EWG is envisaged to include about 5-6 staff who would spend some 3 months twice a year preparing the EWL, and additional Fund-wide resources would be required in setting up and running the VEA, canvassing risks, and preparing the risk database, EWL, and presentation by management. Preliminary estimates suggest that these activities would require a total of 7-8 staff-years per year on a permanent basis, made available from existing resources.[10] An additional 3-4 staff-years in the development phase (mostly in the first year) will be financed from crisis resources.

VII. Issues for Discussion

40. *Do Directors agree that the approach proposed in this paper would significantly improve the Fund's early warning capabilities*?

41. *Do Directors agree with the general modalities for collaboration and information-sharing between the Fund and the FSF envisaged in the paper—with the understanding that this will be subject to further discussion with the FSF*?

42. *Do Directors agree that a restricted presentation by management is the most effective way of communicating the EWE results? Do Directors think that specific countries can be referenced? Should EWE assessments be discussed at the Board at all?*

43. *Should the WEO and GSFR be the main vehicles for conveying the gist of the EWE to the public*?

44. Do Directors agree with the proposed resource envelope?

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[10] This could be viewed in part as the cost of strengthening macro-financial surveillance discussed in the Statement of Surveillance Priorities for 2008-11.

Box 1. How Other Institutions Identify Risks and Vulnerabilities

Many public and private sector institutions regularly identify, measure, and monitor risks. The scope and focus of these exercises typically depends on their objectives. While private firms focus on managing their own exposure to risks (though not necessarily to 'tail' risks), regulators are more concerned about the risks and vulnerabilities that could lead to systemic crises (which are low-frequency events, especially in advanced countries).

Although formal "early-warning" models are not that common, a brief review of approaches used by different institutions to assess risks may yield useful insights for the EWE:

- **In line with their mandate, central banks conduct regular financial stability assessments.** To that end, they use a combination of macroprudential indicators and/or macro models to assess the implications of macroeconomic developments for financial stability (top-down approach), and micro models to assess the soundness of individual institutions (bottom-up approach). The financial stability assessments tend to focus on the underlying vulnerabilities and not on predicting the timing or triggers of a crisis. The early-warning type indicators are typically used as suggestive measures of potential weaknesses, along with other information (including market indicators and market intelligence), to arrive at the overall assessment of financial stability.
- **The BIS conducts assessments of risks and vulnerabilities in the international financial system** that are communicated through its flagship publications, but also through seminars/conferences.
- **The credit rating agencies provide a wide range of credit risk assessments, including for corporate, financial, bank, insurance, and sovereign risks**. In deriving the final ratings, they rely on a combination of quantitative and qualitative information. As in the case of central banks, they use a variety of accounting- and market-based measures of financial soundness for individual institutions, as well as macroprudential indicators.
- **Investment banks (and other private investors) use early warning-type models primarily to assess the risks and underlying vulnerabilities in emerging market countries**. Such models are often used to derive a country-level vulnerability index that is subsequently adjusted based on the analyst's judgment.[1] Such vulnerability indices are used for managing risks, designing trading strategies or advising clients.

Best practices in public and private sector institutions suggest the importance of continuously upgrading the toolkit for risk assessment, but also of establishing robust processes to ensure a *systematic* approach, including the following:

- use of quantitative tools for identifying, measuring and monitoring risks and vulnerabilities;
- an institution-wide qualitative discussion of risks and vulnerabilities,
- policy revisions in response to changes in risk assessments.

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[1] For details, see Annex II in "Assessing Underlying Vulnerabilities and Crisis Risks in Emerging Market Countries—A New Approach" (SM/07/328).

Box 2. The Vulnerability Exercise for Emerging Market Countries (VEE)

Background. The Vulnerability Exercise for Emerging Market Countries (VEE; previously the VE) was established in 2001 as part of a broader initiative to strengthen the Fund's crisis prevention capabilities. The VEE assumed its current form after a comprehensive review in 2005.

Focus and scope. The VEE focuses on *capital account crises* and covers mainly *emerging market countries*—countries most vulnerable to capital-account reversals and associated financial dislocations and output losses. The VEE currently covers around 50 larger countries that are particularly exposed to shifts in global investor sentiment.

Objective. The VEE complements other vehicles of Fund surveillance by providing candid and systematic cross-country analysis of vulnerabilities and crisis risks by combining quantitative assessments with insights from bilateral and multilateral surveillance.

Methodology. The VEE makes a clear distinction between vulnerabilities and crisis risks:

- **Underlying vulnerabilities** refer to economic or financial weaknesses that determine the impact of shocks and render a country crisis-prone in the event of a shock, but not necessarily lead to an immediate risk of crisis. Vulnerabilities are assessed using both quantitative indicators and departments' judgment. Currently, an indicator-based rating is produced, using 20 vulnerability indicators that are grouped in four key areas (external sector, public sector, financial sector, and corporate sector).[1] These indicators are then reviewed by area departments; in the end, each country receives an overall vulnerability rating (High, Medium, Low).
- **Near-term crisis risks,** which relate to the probability that a crisis will happen within 12 months, are assessed using departments' judgment. Assessment of crisis risks takes into account not only underlying vulnerabilities but also risks to the global economic and financial environment; and risks to policy implementation in individual countries.

Scenarios. Analysis of tail risk scenarios—such as adverse shocks to global growth, commodity prices, advanced countries' interest rates—is used for stress-testing key vulnerability indicators to identify potential pressure points. Key scenario parameters are quantified based on model simulations.

Communication. The vulnerability indicators, combined with topical analysis of global developments that affect vulnerabilities and investor perceptions, are summarized in a note to management and discussed at an interdepartmental VEE meeting; key results also provide input for the periodic WEMD briefings to the Board. VEE data/indicators support staff surveillance work more generally; however, even among staff, the note is only distributed on a limited and confidential basis.

[1] Indicators were initially culled from a large set of variables used in empirical EWS models. For each of these indicators, the power to discriminate between crisis and noncrisis cases in a panel data set was examined by searching for a split that minimizes the combined percentages of missed crises and false alarms. Thresholds that yielded the best split were used to map indicator values into zero-one scores. Differences in discriminatory power (minimum sums of errors) provided guidance on weights used to aggregate indicator scores into *sector vulnerability indices*. Sector indices were then combined into an index of *overall vulnerability index*, using judgment-based sector weights. For more details, see "Assessing Underlying Vulnerabilities and Crisis Risks in Emerging Market Countries—A New Approach" (SM/07/328).

Box 3. The Vulnerability Exercise for Advanced Countries (VEA)

Background. The recent crisis has underscored the need for the Fund to focus on vulnerabilities both in emerging market and advanced economies. To this end, a Vulnerability Exercise for Advanced Countries (VEA) is being developed in parallel with the exercise for Emerging Markets (VEE; Box 2). Both exercises will be conducted jointly by MCM, RES, and SPR, in consultation with area departments. An initial run of the VEA is to be completed during the first quarter of 2009.

Focus and scope. The VEA will cover *advanced economies* that have the potential to cause disturbances not only to their own economic or financial systems, but trigger significant dislocations at a regional or global scale. Because crises in advanced countries are less frequent and less likely to involve balance of payments problems, the VEA's primary focus will be on *financial sector crises*, especially systemic ones, and on *recessions* (a significant reduction in growth relative to trend).

Objective. Like the VEE, the VEA is not a crisis prediction tool. Its main goal is to flag the *underlying vulnerabilities*—economic or financial weaknesses that make a country more crisis-prone in the event of a shock. In addition, the VEA will also focus on identifying *systemic pressure points* in the global financial system as well as *spillover channels* that can transmit shocks across countries.

Methodology. The VEA framework is envisaged to include the following standard components:

- **Vulnerabilities**. An empirical methodology similar to the VEE will establish a range of *vulnerability indicators* for individual countries (e.g., booms in private sector credit, house and equity prices, etc.). The exercise will identify thresholds for each vulnerability indicator, which can be aggregated into sectoral, country, regional or global vulnerability indices and tracked over time. Other methods will be used to assess the possible cost and duration of a crisis associated with a country's vulnerability level.
- **Imbalances**. The analysis of vulnerability indicators will be complemented by an examination of *trends in real and financial imbalances* to assess potential for reversals or sharp adjustments. This includes both saving-investment balances across countries and main economic sectors, fiscal trends, and deviations of asset prices (housing, bond, equities) from underlying fundamentals.
- **Short-term risks and contagion**. While vulnerabilities typically build up over a longer time horizon, the VEA will also assess various short-term risk indicators, mostly from financial markets. These include measures of common distress of financial entities or sectors, aggregate leverage and default probabilities, and credit loss expectations. Data on cross-country exposures will be used to analyze the potential for country-to-country or sectoral contagion.

Topical analysis. In addition to the above, which would be repeated for each exercise, part of the VEA could also be used for topical analysis, such as spillovers from advanced to emerging market economies or vice versa. Any such special topics would change for each round, and could be determined as part of the continuous work program, including that informed by previous EWEs.

Communication. The results of the VEA will be summarized in a short and pointed note to management, and discussed at an interdepartmental surveillance meeting, along with the VEE note. The results would flow into the regular work of the Fund and not be communicated directly to non-staff members. Even within the staff, the VEA would only have limited distribution.