CHAPTER

3 The *WEO* Forecasting Process

When the data [are] very noisy [the only way to assess the skill of a forecaster] is to focus more on process than on results.

—Silver (2012, p. 327)

18. Forecasting macroeconomic activity for practically the whole IMF membership presents more difficult challenges than forecasting for a single economy.[8] Idiosyncratic differences among countries, due to structural, geographical, and geopolitical factors, call for specially tailored forecasting approaches and substantial country knowledge. But the forecasts also need to reflect trade and financial linkages with many other countries—requiring a coordination mechanism that entails some degree of centralized guidance.

19. IMF desk economists continuously monitor the economies they cover, assessing how new domestic and external developments may impact the economic outlook. At specific times of the year they produce formal forecasts of main macroeconomic variables. For each economy these formal forecasts are made at regular intervals in the context of Article IV consultation missions and during the various *WEO* forecast rounds. Formal forecasts are also presented in documents related to IMF-supported programs.

20. This chapter evaluates the process by which the formal forecasts are made, concentrating on the *WEO* forecast rounds because these illustrate the unique multi-country aspects of IMF forecasts. The assessment focuses on the transparency, integrity, and timeliness of the process. Skepticism, suspicion of political interference, and questions about evenhandedness can easily arise given the inherent uncertainty of the environment, and the time lag required to ascertain the accuracy of the forecasts.[9] Thus it is essential that users of the forecasts understand and trust the integrity of the forecasting process. This chapter starts by describing the forecasting process and assessing whether it is well designed to deal with the challenges inherent in producing forecasts for a large number of heterogeneous economies (Sections A–D). Section E of the chapter reports survey evidence on how country authorities perceive the forecasting process, and Section F provides an overall assessment.

A. The *WEO* Forecasting Process: A Combination of Bottom-Up and Top-Down Approaches

21. Coordinated by the IMF Research Department, the *WEO* forecasting process combines “top-down” and “bottom-up” approaches (Box 1). At the beginning of the *WEO* forecasting cycle, representatives from area departments and key functional departments meet as the Interdepartmental Forecast Committee (IDFC) to exchange views about developments in the global economy and in major countries and regions.[10] The discussions benefit from the inputs from area departments and are informed by the outlook for commodity prices, conditions in world financial markets, fiscal policy developments, and a set of forecasts from a global econometric model—the Global Projection Model (GPM) maintained at the Research Department (see the

[8]This chapter draws on a detailed treatment in Genberg, Martinez, and Salemi (2014).

[9]Indeed, such suspicions and questions have been raised in the academic literature (see Genberg and Martinez, 2014b and Luna, 2014b for reviews), in interviews with country officials, and in the press.

[10]Although the IDFC is relatively new it already plays an important role in the initial *WEO* coordination process. The Committee is cochaired by a representative from the area departments and the Deputy Director of the Research Department responsible for the *WEO*. Participating in the meetings of the IDFC are representatives from all five area departments, as well as the Fiscal Affairs, Monetary and Capital Markets, Research, and Strategy, Policy, and Review Departments. The discussions in the committee center on the near-term outlook, and they do not appear to lead to explicit guidance about longer-term developments in member countries related to the structural determinants of economic growth.

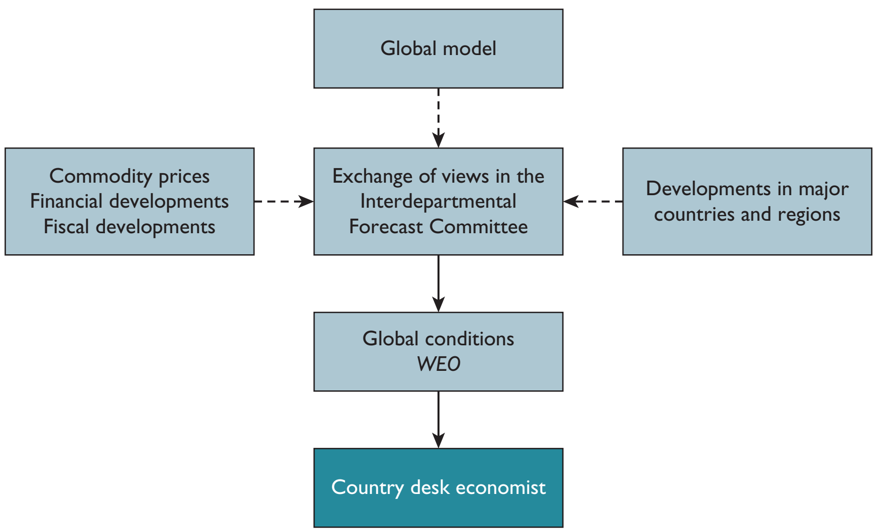
Box 1. Bottom-Up Versus Top-Down Approaches to Multi-Country Forecasting

An advantage of a pure bottom-up approach is that it places the task of forecasting in the hands of country experts who follow country-specific economic developments on a daily basis and are in close contact with government officials and private sector experts. Such an approach also allows desk economists to use whatever model seems best suited to capture the essential features of each particular economy. Limitations of the pure bottom-up approach are that different country desks may make different assumptions about worldwide economic conditions, and that no checks and balances ensure regional and global consistency among the forecasts.

A pure top-down approach uses one model or a set of linked models to generate forecasts for all countries and regions. This approach guarantees that forecasts are conditioned on common initial assumptions, and that aggregation restrictions on regional and global forecasts are satisfied. But the complexity of this sort of modeling quickly becomes intractable for even just a moderate number of countries unless most characteristics and information specific to each economy are sacrificed.

Thus, some combination of the two approaches is desirable.

Figure 1. Establishing Initial Conditions



dashed arrows in Figure 1).[11] The result of the discussions is a set of initial global conditions that is transmitted by the *WEO* coordination team to each country desk economist (see the solid arrows in Figure 1).

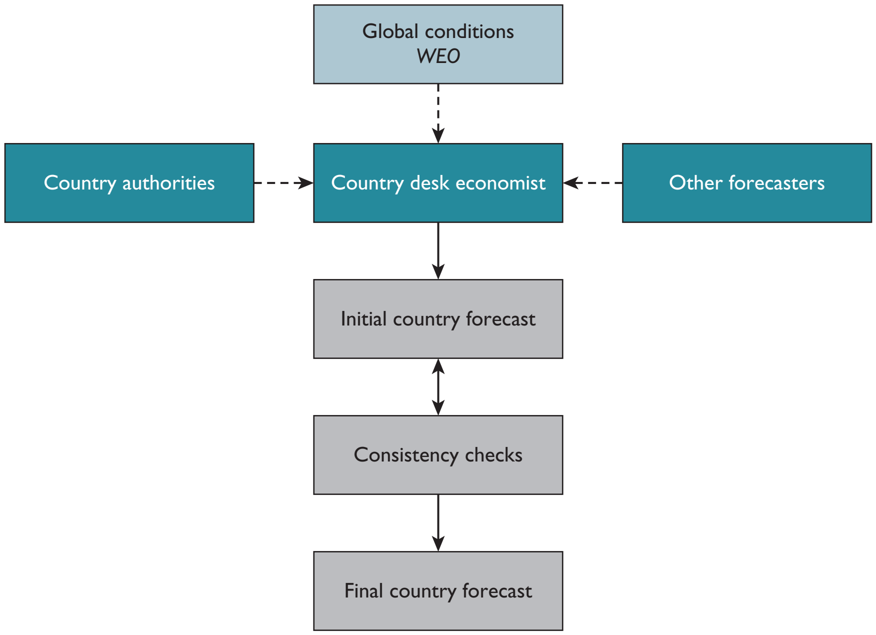
22. Country desk economists combine the set of global conditions received from the *WEO* team with other inputs they regularly obtain from country authorities and from other forecasters, as well as with economic intelligence gathered sometimes on a daily basis (Figure 2). Using methods and approaches that can vary substantially across countries, the desk economists update their forecasts and transmit them to the *WEO* team.[12] Before the forecasts are sent to the *WEO* team, they have typically been reviewed within the relevant area department to ensure consistency among the country forecasts made within the region as well as consistency with the global and regional outlook established in the initial phase of the forecasting process.[13]

[11]This model currently covers six countries/regions of the world: Asia excluding Japan, Japan, the euro area, the United States, the Western Hemisphere, and the rest of the world. It is important to note that the forecasts from the GPM are themselves informed by inputs from area and functional departments and incorporate substantial elements of judgment. In December 2013, an IMF Working Paper describes that China has been added as a separate block in the GPM. See Blagrave and others (2013).

[12]Section E below describes the forecasting process at the level of the country desk.

[13]The type of coordination varies across the area departments. For example, in the European Department it is carried out using a GPM-type model developed for the largest economies in the region. In other departments structured informative interactions take place without reliance on a formal econometric model, while in yet others the coordination can be perfunctory.

Figure 2. Production of Forecasts by Country Desk Economists



23. The *WEO* team carries out further consistency checks in coordination with country desks/departments. For example, the aggregated current account balance for the world, as implied by country desk forecasts, must not be too different from zero.[14] Once the iterative process is finished, the country desk economists submit their final forecasts into the data management system maintained by the *WEO* team. After two meetings to communicate the findings to the Board of Executive Directors, these are the forecasts published in the *WEO*.

B. Duration of a Typical *WEO* Forecast Round

24. The overall duration of the full *WEO* forecast round is significantly longer than the comparable processes at other institutions (Box 2), in part because the coordination built into the Fund's process is time-consuming, and in part because it includes the preparation of the descriptive and analytical chapters that accompany the forecasts in the *WEO* publication.[15] The Fund's top-down phase typically takes about four weeks to complete, while the entire process requires between three and four months.

C. The Role of IMF Management and the Executive Board

25. IMF Management gives its formal approval to the publication of the *WEO* document as a whole. Management also has an indirect impact on the forecasts themselves. The First Deputy Managing Director (FDMD) participates in a weekly Meeting on Surveillance Issues[16] that assesses global economic conditions along with the most recent forecasts produced by the Global Projection Model. Comments by the FDMD at

[14]A number of other checks are also carried out to ensure that accounting identities are respected and that standard theoretical presumptions are not violated. Other checks are intended to detect possible reporting errors, and yet others will flag anomalous changes in the forecast relative to the most recent forecast or unusually large changes in the data. Forecasts for selected large economies also undergo special scrutiny by staff of the Research Department, mindful of their importance for the world economic outlook generally. Interviews with staff revealed that the checks, although often somewhat mechanical, are generally considered useful. A number of interviewees felt that it would be valuable if greater economic content could be included in the feedback given by the Research Department.

[15]Survey responses and interviews confirmed the high value that country officials and private sector economists attach to these descriptive and analytical chapters. The timeliness of the actual point forecasts is thus not considered as important an issue for IMF forecasts as for private sector forecasts.

[16]The meeting brings together the FDMD, the Economic Counsellor, the Financial Counsellor, and two representatives from each department.

Box 2. Multi-Country Forecasting at Other Organizations

One way to gain perspective on the IMF forecasting process is to consider how global forecasting is done in other international agencies and in the private sector. This box summarizes aspects of the forecasting process at the U.S. Federal Reserve Board (FRB), the Organization for Economic Cooperation and Development (OECD), the Asian Development Bank (ADB), the European Commission (EC), and three global investment banks.

Institutions combine top-down and bottom-up approaches to different degrees. The OECD arguably applies the most top-down process. It produces forecasts twice a year for the 35 OECD countries and for the BRIICS group (Brazil, Russia, India, Indonesia, China, and South Africa). Like the IMF, the OECD also produces two updates to these forecasts annually. Each of the major forecast rounds takes 40 working days. The top-down approach is implemented by means of strong guidelines that OECD directors issue for country desks.

Among public institutions the FRB arguably lies closest to the bottom-up spectrum of possible approaches. FRB economists produce forecasts for 25 foreign economies that together account for more than 90 percent of U.S. trade. The FRB forecasting process occurs eight times a year, each time lasting two weeks. FRB forecasters are typically not constrained by top-down guidance in the construction of forecasts, nor are they generally required to satisfy any adding up constraints, although occasionally they may be asked to reconsider when the implied aggregate current account balance for the United States seems out of line.

Of the other official institutions, the EC is more like the IMF in that country desk economists are given common background conditions, including forecasts for relevant non-EU economies as well as for commodity prices. They are also given broad EU and euro area forecasts as guidelines, but are not strictly constrained by these when they prepare their own forecasts. The ADB also follows a mixed approach, giving country desk economists substantial autonomy.

Private sector institutions generally have the most bottom-up processes. Global investment banks typically produce forecasts bi-weekly. While there may be some centralized guidance, coordination between country desks and the chief economist unit typically takes place by means of a conference call in which peers scrutinize and comment on each country forecast.

What may explain these institutional differences? First, producing frequent forecasts may preclude an elaborate process for reconciling views from the center and from country specialists. This means that a largely bottom-up approach is almost inevitable for global investment banks that produce forecasts every other week.[1] If timeliness is not the most valued feature of the forecast, a more inclusive iterative process can be considered in which country, regional, and global perspectives are brought to bear.

When most of the economies of interest are affected by common factors, it is justified to use a more centralized approach with a top-down view, as in the OECD, and not let country desk economists deviate extensively from that view. For the IMF, by contrast, which must produce forecasts for countries with vastly different economic structures, an approach in which idiosyncratic factors are allowed to play a more significant role is more suitable.

[1]For reasons explained in Box 1 we exclude the option of adopting a single centralized model for all economies. Such a model could in principle produce forecasts at a high frequency but their reliability would be doubtful.

this weekly meeting filter down to desk economists through department representatives at the meeting and through the Interdepartmental Forecast Committee.

26. *WEO* forecasts are presented twice to the Executive Board, once one to two months before the final publication and once about two weeks before it. After Board members' comments are received in the first of these meetings, the staff have the opportunity to revise the forecasts if there are reasons to do so. The second meeting is mainly to brief the Board before the *WEO* is published.

27. Board members also interact with staff during the preparation of country forecasts, whether by relaying information from the country authorities they represent or by providing their own perspectives. But the Board does not formally endorse the forecasts, which remain the views of staff.

D. User Perspectives on the IMF Forecasting Process

28. The perspectives of users of IMF forecasts on various aspects of the forecasting process—its general soundness, the extent to which it is well documented, and whether it is based on an appropriate degree of interaction with national authorities—were gathered by means of a survey of member country officials from central banks and finance ministries. The responses generally reveal a positive attitude towards the forecasting

process, although there are cases when some concern is warranted.

29. A large majority of the respondents agreed that *WEO* and Article IV forecasts are free of political influence (Figure 3). In addition, respondents generally felt that IMF forecasts provide an accurate picture of their country's economy in both the *WEO* and Article IV contexts. These findings suggest that country authorities place substantial confidence in the integrity of the IMF forecasting process. They hold across country groupings based on geographical location, degree of economic development, and on whether or not the country has recently negotiated a program with the IMF.

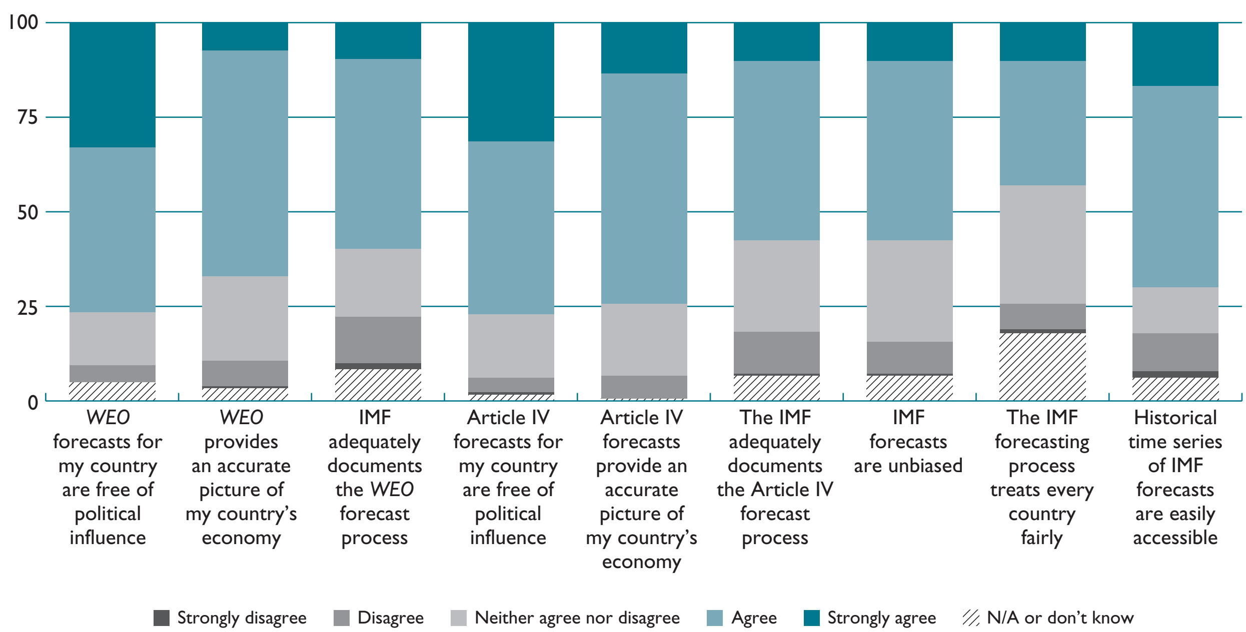
30. Country authorities generally have a favorable opinion about the transparency of the forecasting process (Figure 3). This perception is squarely at odds with opinions expressed in interviews with the evaluation team by several Executive Directors and country authorities who saw the forecasting process at the IMF as a "black box"—a view echoed by some staff in post-survey interviews. It is also at variance with the experience of the evaluation team. For lack of comprehensive documentation of the forecasting process, it took the team considerable effort to combine information from various sources to determine the exact nature of the process at the level of the country desk economist and at the level of the coordination of forecasts within departments and at the IMF as a whole. Likewise, obtaining complete historical data series on forecasts would have been challenging if the team had not had access to the internal website of the IMF.

31. Post-survey interviews with senior country officials provided further perspectives. Interviewees generally did not have a firm knowledge about the forecasting process at the IMF, but their views differed on whether this mattered.[17] Some "did not care" about the details of the forecasting process as long as the results were of high quality, while for others, not knowing the details about the forecasting process was not a concern because they trusted the integrity of IMF staff. Still other country officials thought that providing more information about the forecasting process would add credibility to the forecasts and reduce risks of misunderstanding.

32. Country authorities are generally satisfied with the interaction with staff that takes place during the preparation of Article IV forecasts (Figure 4). Large majorities indicated that IMF forecasts take into account

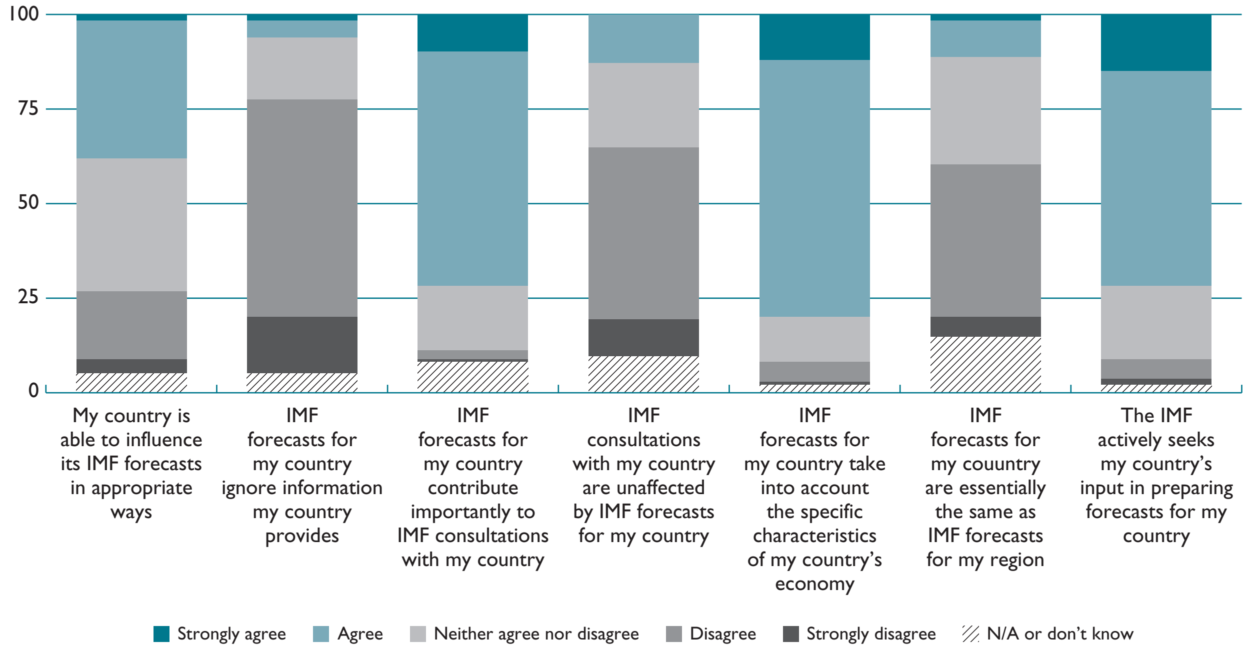
[17]Officials at the level of department director from the central bank or the finance ministry/treasury in 17 countries were interviewed. Of these no one claimed to have a firm knowledge of the forecasting process at the IMF.

Figure 3. Survey Question: "Please Rate Your Agreement with Each of the Following Statements About the Process Through Which IMF Forecasts Are Produced"
(Country authorities, full sample, 179 respondents; in percent)



Source: IEO calculations based on IEO Forecast Evaluation Survey.

Figure 4. Survey Question: "Please Rate Your Agreement with Each of the Following Statements About the Construction and Use of Article IV Forecasts for Your Country"
(Country authorities, full sample, 179 respondents; in percent)



Source: IEO calculations based on IEO Forecast Evaluation Survey.

specific characteristics of their country's economy, and that the IMF actively seeks their country's input in preparing the forecasts. Fewer than a quarter of the respondents believe that they are unable to influence the IMF forecasts in appropriate ways. This said, an alternative way to describe the responses to this question would be that fewer than 50 percent of country authorities "agree" or "strongly agree" that they are able to influence IMF forecasts in appropriate ways.[18,19]

E. How Country Desks Produce Their Forecasts

33. Based on a survey of country desk economists and follow-up interviews, this section discusses the methods used to produce individual country forecasts and the basis on which these methods are chosen. The methods vary substantially depending on country characteristics, but they do not differ significantly according to the proposed uses of the forecasts, whether for Article IV consultations, a *WEO* round, or a program negotiation (Box 3).

34. The Fund's spreadsheet-based macro framework,[20] judgment, and forecasts produced by country authorities are used much more widely than are methods based on structural econometric models, vector-autoregression (VAR) or reduced-form equations (Figure 5). This finding holds regardless of whether countries are grouped by region, level of income, or degree of commodity export concentration. Statistical models of the structural, VAR, or reduced-form type are much less important in forecasting for low-income countries than for advanced countries, principally because of the differences in data availability between these types of economies.

35. Data availability is the single most important factor in the choice of forecasting method (Figure 6). Time constraints and the strategy used by the desk economist's predecessor are also important considerations.

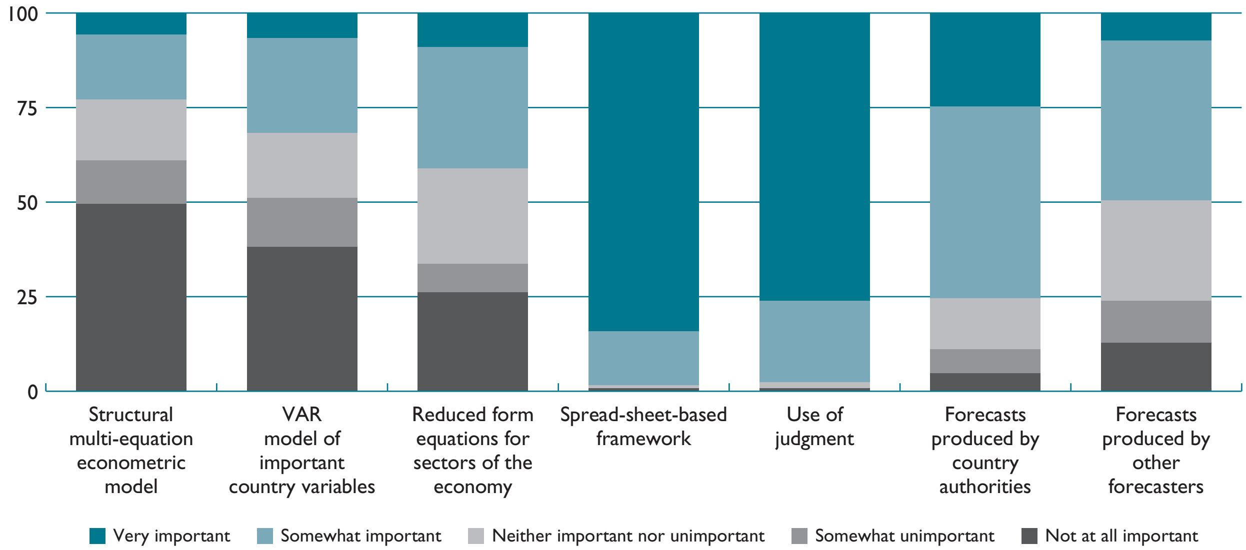
36. The evaluation team conducted post-survey interviews with staff asking how the spreadsheet-based

[18]This is one instance where it is possible to view the responses either as "the glass being half empty" or "half full" depending on the chosen point of reference.

[19]A potential difficulty in interpreting the responses about lack of political influence on forecasts is that what one country considers "appropriate influence" another may consider less benign.

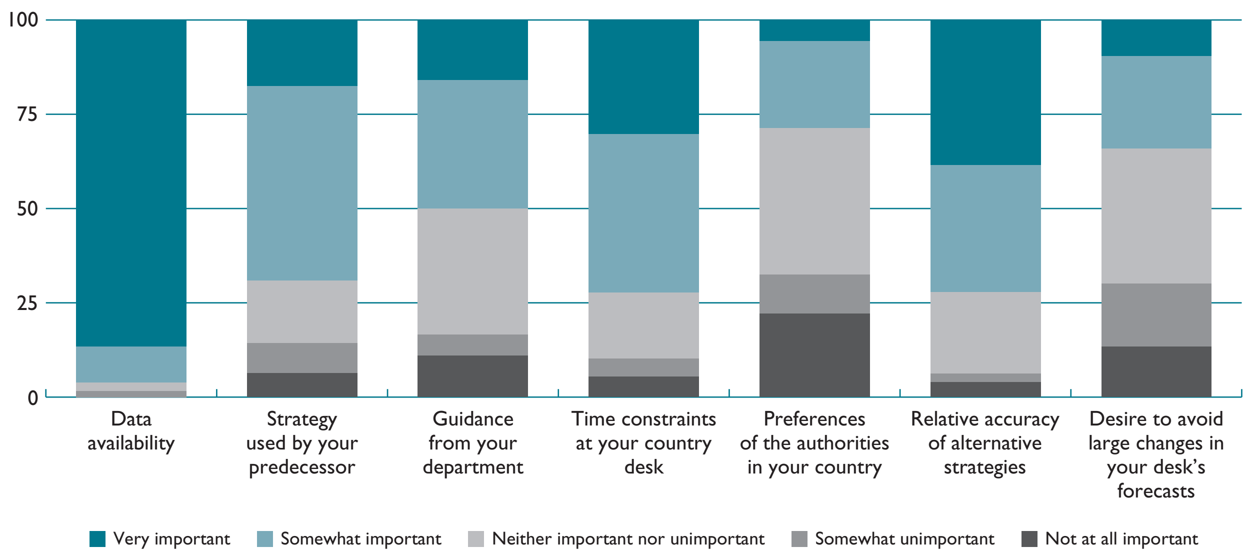
[20]Formerly termed the "financial programming framework," and described later in this section.

Figure 5. Survey Question: "Please Check the Box That Best Describes the Importance of Each of the Following METHODS to the Production of Your Country Desk's Forecasts"
(IMF desk economists, full sample, 122–26 respondents; in percent)



Source: IEO calculations based on IEO Forecast Evaluation Survey.

Figure 6. Survey Question: "Please Check the Box That Best Describes the Importance of the Following Factors in Your Desk's CHOICE of Forecast Methods for the Product of Your Country"
(IMF desk economists, full sample, 125–26 respondents; in percent)



Source: IEO calculations based on IEO Forecast Evaluation Survey.

macro framework is used for forecasting. This framework is a set of relationships among economic variables built into spreadsheets that jointly describe a country's flow of funds. Country desk economists employ these spreadsheets to organize information for their routine analysis of the economy and to support forecasts. The relationships primarily consist of macroeconomic accounting identities but may also include a

Box 3. Comparing the Article IV, Program, and *WEO* Processes for Producing Country Forecasts

Starting from a macro framework, IMF staff produce forecasts for Article IV surveillance consultations[1] and for country program discussions, as well as for the *WEO*. For any particular economy, the methodology and techniques used to obtain these three types of forecasts are substantially the same, but differ in a few ways, explained here.

Article IV consultations and program discussions and reviews can occur at any point in a calendar year and forecasts are produced whenever such events occur. When an Article IV consultation coincides with a *WEO* round, then the Article IV forecasts for the country in question are identical to the forecasts submitted to the *WEO*. Indeed, Article IV consultations with G7 countries are now scheduled to coincide with *WEO* rounds so that the Article IV and *WEO* forecasts for the G7 are identical.[2]

When an Article IV consultation or program discussion does not coincide with a *WEO* round, the country desk economist uses the most recent *WEO* forecasts as a starting point and updates them based on discussions with, and data from, country authorities before and during the Article IV or program mission. If the desk economist judges that conditions have not changed, then the forecasts will be the same as the most recent *WEO* forecasts. In creating the Article IV and program forecasts, the desk economists do not automatically have the benefit of a new memo on initial global conditions, but they do have access to the most recent forecasts from the Global Projection Model. Program and Article IV forecasts are also not subject to aggregation checks since other country desks are not necessarily producing forecast updates at the same time. However, the area department still reviews the individual forecasts.

In the context of program countries, forecasts of variables used in the program's "quantitative targets" have special features: future disbursements by the Fund and the perceived success of the program are conditional on meeting those targets, and the authorities can play a determining role in whether the targets are met.

In summary, Article IV, program, and *WEO* forecasts can be thought of as snapshots of a continuous forecasting process used by country desk economists. The first two involve greater interaction with country authorities and less top-down direction, whereas the last entails significant formal top-down elements to ensure global consistency.

There is one other way in which the Article IV and program forecasting processes differ from the *WEO* forecasting process. In the *WEO* process, the IMF Executive Board is briefed on the *WEO* before the report is published, but does not officially approve the report, which is considered a staff document. In the Article IV bilateral surveillance process, and even more so in the context of a program discussion, the IMF Executive Board is asked to broadly endorse the staff appraisal contained in the Article IV report or program document prepared by staff. The staff appraisal is based in part on the forecasts produced for the economy.

[1] The Integrated Surveillance Decision , adopted in 2012, made Article IV consultations a vehicle of both bilateral and multilateral surveillance. Prior to this decision, Article IV consultations were a vehicle of bilateral surveillance only.

[2] A comparison of Article IV and *WEO* forecasts for G7 countries for the period 2009–13 shows that they are the same for all practical purposes.

small number of behavioral equations and arbitrage conditions.

37. The answers in the interviews showed that application of the framework is highly country-specific. Often, "satellite" models are used to forecast certain parts of the spreadsheet, but in other cases, forecasts are simply entered based on judgment with varying degrees of sophistication. Sometimes behavioral relationships are used to link different sectors in the framework. In every case, the macro framework is considered essential as it provides a consistency check on forecasts across sectors within the economy and across different forecast horizons.

38. In interviews, staff also mentioned a close relationship between country desks' forecasts and consensus forecasts as issued by Consensus Economics.[21] They noted that there is substantial interaction and sharing of information between IMF desk economists and forecasters in the private sector. A number of interviewees noted that an IMF desk economist may hesitate to deviate from consensus forecasts, because "rocking the boat" in this way would call for lengthy and elaborate justifications in the course of the departmental and interdepartmental review process.

F. Assessment

39. Is the IMF's forecasting process well suited for the purpose it is intended to serve? Is it perceived as sound, evenhanded, and transparent by member country authorities? The findings reported in this chapter imply a broadly affirmative answer to the first question, but indicate that there is some room for improvement with respect to the issues raised in the second.

[21] See www.consensuseconomics.com.

40. The combination of centralized guidance and desk economists' expertise that characterize the forecasting process is appropriate, as judged both by the challenges of producing mutually consistent forecasts for a large number of countries that differ from each other in important ways and by a comparison with the processes used in other institutions producing multi-country forecasts. For some member countries, the IMF forecasts are the only ones available—highlighting their characteristic as public goods.

41. Though the *WEO* forecast rounds typically take more time than the corresponding rounds in other institutions, especially those in the private sector, the frequency of the forecasts is not as important as in the private sector. The value of the *WEO* forecasts lies as much in the analysis that accompanies them, including risk scenarios and assessments, as in the point forecasts themselves.

42. The methods that country economists use to produce forecasts differ across countries in ways that appear appropriate given differences in country data availability and stage of economic development. Likewise, the evidence that judgment is an important element in the forecasting process is consistent with best practice.

43. Can methods and practices be improved? A number of staff indicated in interviews that a good forecasting record is not a sufficiently appreciated element in staff performance appraisals, and that this reduces staff incentives to allocate time to forecasting. Interviews also revealed that the passing of the baton from one desk officer to another sometimes leads to a loss of information about the economy, both in terms of existing modeling work and in terms of "soft" knowledge that informs judgment.

44. The evaluation team found that it took considerable effort and time to obtain a clear picture of the forecasting process both at the level of the institution as a whole and at the level of country desks, substantiating the view of some officials who felt that the process was opaque.

45. Country authorities have confidence in the integrity of IMF forecasts. A majority of them believe that IMF forecasts are unbiased, treat every country fairly, and provide an accurate picture of their economies. But some thought otherwise (Figure 3). The next chapter assesses whether the forecasting process has led to forecasts of adequate quality.