



Independent Evaluation Office
of the International Monetary Fund

BACKGROUND PAPER



BP/14/03

The IMF/WEO Forecast Process

Hans Genberg, Andrew Martinez, and Michael Salemi

IEO Background Paper
Independent Evaluation Office
of the International Monetary Fund

The IMF/WEO Forecast Process

Prepared by Hans Genberg, Andrew Martinez, and Michael Salemi

February 12, 2014

Abstract

This paper describes and assesses how the IMF produces forecasts for use in the *World Economic Outlook (WEO)* and Article IV consultations. We draw on surveys and interviews of producers and users of the forecasts, and on comparisons with the practices of other organizations. We conclude that the IMF's process is generally appropriate: through well structured coordination arrangements it reconciles forecasts made independently by economists covering each of a large numbers of contrasting economies with the need to produce a coherent view of world economic prospects, achieved in part by relying on a global projection model. Member country authorities by and large place substantial confidence in the integrity of the IMF forecast process. For the most part they believe that the forecasts provide an accurate picture of their country's economy, and that they are free of political influence. Looking ahead, the IMF should introduce processes and incentives to prevent crucial information being lost when one desk economist succeeds another, and to encourage learning from reviews of past forecast performance. And, as one way to allay fears among country authorities that the forecast process is opaque and does not treat countries evenhandedly, the IMF should prepare a description of the IMF forecast process intended for authorities in member countries and other users of these forecasts. The description should be posted on the publicly accessible part of the IMF website, and it should be reviewed and revised as needed.

The views expressed in this Background Paper are those of the author(s) and do not necessarily represent those of the IEO, the IMF or IMF policy. Background Papers report analyses related to the work of the IEO and are published to elicit comments and to further debate.

JEL Classification Numbers: C530

Keywords: Forecast evaluation, IMF, *World Economic Outlook*

Author's E-Mail Address: Genberg@verbier.ch; andrew.martinez@economics.ox.ac.uk; Michael_Salemi@unc.edu

Contents	Page
Abbreviations	v
I. Introduction	1
II. The IMF Forecast Process	2
A. Actors in the IMF Forecast Process	4
B. Information Flows of the IMF Forecast Process	5
C. Duration of the IMF Forecast Process	8
D. Comparison of the Article IV and <i>WEO</i> Forecast Processes	9
III. Multi-country Forecasting: Challenges and Solutions	10
A. Challenges and Solutions at the IMF	11
B. Practices at Other Organizations	15
IV. How Country Desks Produce Forecasts at the IMF	17
A. Choice of Forecast Method	17
B. Reasons for the Choice of Forecast Method	19
C. Interactions with Country Authorities	21
V. Perspectives on the IMF Forecast Process	21
A. Perspectives of Staff	22
B. Perspectives of Country Authorities	25
VI. Conclusions and Issues for Reflection	28
A. The <i>WEO</i> Forecast Process	28
B. Comparison with Other Organizations Producing Multi-Country Forecasts	29
C. The Nature of Bottom-Up Forecasts	29
D. Issues for Reflection	30
 Figures	
1. The IMF Forecast Process Combines Top-Down and Bottom-Up Approaches	3
2. How the IMF Produces the <i>World Economic Outlook</i> Forecasts	5
3. Duration of <i>WEO</i> Cycle	9
4. Choice of forecast method: Survey responses, IMF Desk Economists, full sample—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."	17
5. Choice of forecast method: Survey responses, IMF Desk Economists—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."	19
6. Reasons for choice of forecast method: Survey responses, IMF Desk Economist, full sample—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."	20

7. Interactions with country authorities: Survey responses, IMF Desk Economists, full sample—Survey question: "Please rate the importance of each of the following country authority interactions for your forecasts."	21
8. Opinions on the IMF forecast process: Survey responses, IMF Desk Economists, full sample—Survey question: "Please rate your agreement with each statement below based on your views about how IMF country forecasts are produced."	22
9. Country authorities' views of the forecast process: Country authorities, full sample—Survey question: "Please rate your agreement with the following statements about the process through which IMF forecasts are produced."	25
10. Country authorities' views of the forecast process: Program and non-program countries—Survey question: "Please rate your agreement with the following statements about the process through which IMF forecasts are produced."	26
11. Private sector views of the forecast process: Full sample—Survey question: "Please rate your agreement with the following statements about the process through which IMF forecasts are produced."	27
12. Country authorities' views of the forecast-consultation process: Full sample—Survey question: "Please rate your agreement with each of the following statements about the construction and use of Article IV forecasts for your country."	28
Tables	
1A. How often does your desk conduct a statistical analysis of the forecast errors for your country?.....	24
1B. To assess the performance of the forecasts for my country, my country desk compared its forecasts to... ..	24
Annex. The Forecast Process in Other Organizations Producing Global Forecasts.....	33
References.....	32

ABBREVIATIONS

ADB	Asian Development Bank
AEO	Asian Economic Outlook
AFR	African Department
APD	Asia and Pacific Department
BRIICS	Brazil, Russia, India, Indonesia, China, South Africa
DEFA	Directorate of Economic and Financial Affairs
DSGE	dynamic stochastic general equilibrium
EC	European Commission
EMD	Economic Modeling Division
EU	European Union
EUR	European Department
FAD	Fiscal Affairs Department
FOMC	Federal Open Market Committee
FRB	Federal Reserve Board
GPM	Global Projection Model
GS	Goldman Sachs
IDFC	Interdepartmental Forecast Committee
JPM	JP Morgan
MCD	Middle East and Central Asia Department
MFRD	Macroeconomics and Finance Research Division
MCM	Monetary and Capital Markets Department
MPD	Macroeconomic Policy Division (OECD)
MSI	Meeting on Surveillance Issues
OECD	Organization for Economic Co-operation and Development
PPP	purchasing power parity
RES	Research Department
SPR	Strategy and Policy Review Department
STEP	Short-Term Economic Prospects
VAR	vector auto regression
<i>WEO</i>	<i>World Economic Outlook</i>
WES	World Economic Studies Division
WHD	Western Hemisphere Department
WTO	World Trade Organization

I. INTRODUCTION

1. This background paper explains the process through which the IMF produces forecasts and forecast-based analysis for publication in the *World Economic Outlook (WEO)* and use in Article IV consultations; assesses the forecasting process, using information from interviews and survey responses received from users and producers of the forecasts, as well as comparisons with the processes used in other organizations; and based on the findings, highlights some issues for consideration with a view to strengthening the forecast process.
2. The IMF forecast process¹ has changed dramatically in recent years as new models and computational strategies have become available and new organizational mechanisms have been implemented, but in the interest of focus and clarity this paper describes the IMF forecast process as it exists today. It explains the different techniques used by IMF country desks to produce forecasts and the process by which these are made mutually consistent and combined to provide a world economic outlook.
3. To assess the IMF forecast process the evaluation team designed three surveys, targeted to IMF country desk economists, member country authorities, and forecast experts in the private sector. An outside vendor was contracted to administer the survey and collect the responses.² After the evaluation team had received and reviewed the survey results, it conducted a set of follow-up interviews with randomly chosen IMF economists in order to obtain complementary information on the survey findings.
4. The paper has five sections. Chapter II describes the iterative process through which IMF forecasts are produced, and compares the *WEO* forecast process with the forecast process used in the context of Article IV consultations.
5. Chapter III explains the challenges faced by an agency that produces multi-country forecasts and explains how the IMF and other international entities meet those challenges. Where appropriate, it compares the process used in the IMF with processes used by the Organisation for Economic Co-operation and Development (OECD), the U.S. Federal Reserve Board (FRB), the European Commission (EC), and several private-sector forecasters.
6. IMF forecasts are produced by country desk staff using techniques of their own choosing. Chapter IV uses responses from the survey of country desk economists to describe

¹ In the interest of brevity, we will use the term “IMF forecast process” to mean the IMF forecast process that produces forecasts that are published in *WEO* and prepared for Article IV consultations. The reader is reminded that forecasts are also produced in the context of IMF programs. These forecasts are the subject of a separate background paper for the evaluation. See Luna (2014).

² See Genberg and Martinez (2014a) for a detailed description of the survey process including the exact wording of the questions asked and aggregated responses.

the choices that country desks make and to explain the considerations that lead to those choices. In particular, it documents the degree to which country desk economists rely on models versus judgment; the interaction between country desk economists and country officials during the forecast process; and interactions between country desk economists and their divisions/departments, and the *WEO* team in the Research Department (RES).

7. Chapter V uses information from survey responses and interviews to assess various aspects of the IMF forecast process including its organizational efficiency, the quality of feedback provided during the process, and the importance of the views of country authorities to the production of forecasts. It discusses the appropriateness of chosen forecast methodologies and assesses whether there is a need for increased coordination within or across departments in the preparation of country forecasts.

8. Chapter VI concludes; it summarizes the paper's findings and raises a number of issues that we believe should form the basis of reflections on the forecast process by IMF and *WEO* Management.

II. THE IMF FORECAST PROCESS

9. The *WEO* is published twice a year, in the Spring to coincide with the Spring Meetings of the IMF and in the Fall to coincide with the Annual Meetings. Updates of the forecasts for the largest economies, which the IMF calls Group A countries,³ are published in January and in June/July. The processes that the IMF uses for the two main *WEO* forecasts and the two updates are largely the same apart from the fact that the latter involve fewer countries and therefore take somewhat less time. For that reason, this paper makes no distinction between the *WEO* and the updates processes and instead uses the term "*WEO* forecast" process to apply to both.

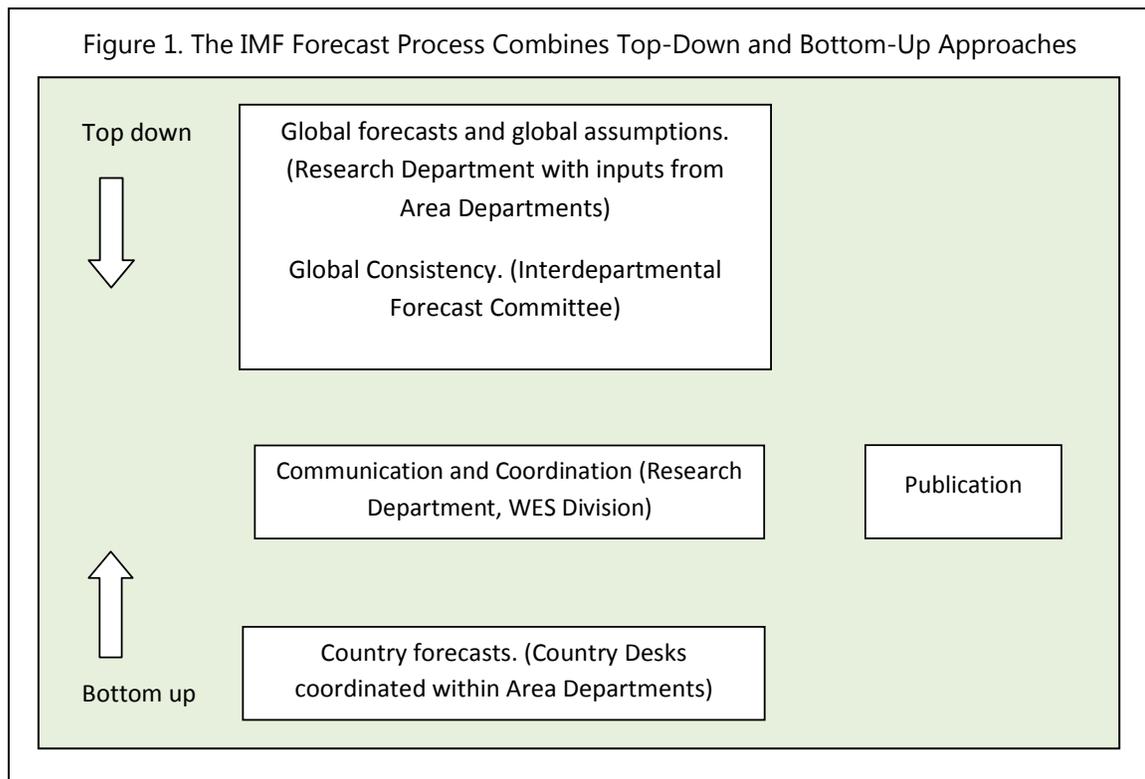
10. IMF staff also produce forecasts that are used in Article IV consultations with individual countries and published in the corresponding country reports. The process at the country level for producing Article IV forecasts is substantially the same as that used for the *WEO* and the *WEO* updates. Differences between the Article IV process and the *WEO* process occur because Article IV consultations and the associated forecasts are spread throughout the calendar year. We describe these differences later in this chapter.

11. The principal challenge that must be dealt with when forecasts are produced for a very large number of diverse member countries is how to combine the in-depth country knowledge that individual desk economists can bring to the forecast process with the need for some consistency between each of the individual forecasts and the global outlook implied by

³ The 47 Group A countries together account for about 90 percent of world GDP. Their distribution by department is: Africa (6), Asia Pacific (11), Europe (14), Middle East and Central Asia (8), Western Hemisphere (8).

aggregating those forecasts. The IMF has addressed this challenge by combining top-down and bottom-up approaches.

12. The top-down approach entails the production of highly aggregated global forecasts using formal econometric models, a set of assumptions about the future paths of a few crucial global variables such as oil prices, and the communication of the aggregated forecasts and background assumptions to country desk economists (Figure 1). The bottom-up approach entails the production of forecasts by country desk economists, each of whom uses whatever forecast methods and information he/she judges to be most appropriate for the country in question.



13. After country desk officers submit their first set of forecasts, an iterative process begins. During this process, the country-level forecasts are reviewed within the respective area department and aggregated. The aggregated forecasts are then checked for consistency and compared to the forecasts produced by the top-down approach for the world and its regions. When various adding-up constraints cannot be satisfied or when gross inconsistencies emerge between aggregated country desk forecasts and top-down forecasts, country desks are asked to revise their forecasts with an eye to removing the discrepancies. Once the process converges, the forecasts are deemed ready for publication.

14. The remainder of this chapter describes in detail the actors involved in the forecast process, the information flows that take place among them, and the typical duration of the

forecast round. It also explains differences between the *WEO* forecast process and the Article IV forecast process.

A. Actors in the IMF Forecast Process

15. The production of IMF forecasts entails interactions among many different IMF units and between those units and country authorities. The IMF Research Department's Economic Modeling Division (EMD) is responsible for producing forecasts with the Global Projection Model (GPM) as inputs to the *WEO* process.⁴ The Research Department's World Economic Studies Division (WES) is responsible for coordinating the production of forecasts by country desks and for producing the forecast-based analysis that is published in the *WEO*.

16. Country desks are responsible for producing IMF forecasts for their individual economies. These forecasts are coordinated within each area department.⁵

17. The IMF's Interdepartmental Forecast Committee (IDFC) coordinates information-sharing between country desks and EMD in order to promote a global perspective in the forecasting process. The Committee includes representatives from each area department and from Fiscal Affairs (FAD), Monetary and Capital Markets (MCM), WES, EMD, the Commodities Unit, and Strategy and Policy Review (SPR). Others may be invited to participate depending on global economic conditions and issues. A representative from the area departments and the Deputy Director of the Research Department responsible for the *WEO* co-chair the Committee.

18. The IMF's weekly Meeting on Surveillance Issues (MSI) brings together the First Deputy Managing Director, the Economic Counselor, the Financial Counselor, and two representatives from each IMF department. Though its primary function is to provide IMF Management with a weekly assessment of global economic conditions, the meeting also plays a role in the IMF forecast process as it reviews GPM forecasts and forecast updates when they are available.

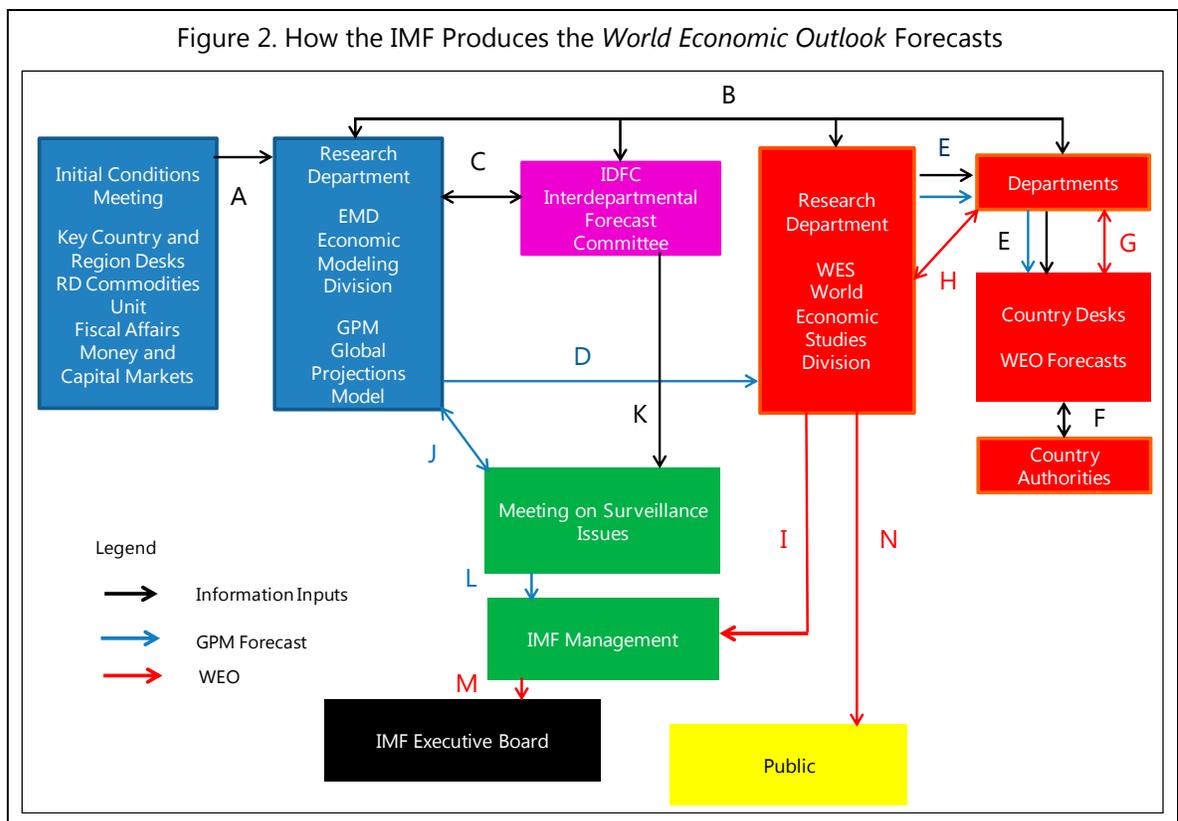
19. Country authorities are an important part of the forecast process as they bring perspectives on economic conditions, economic policies, and other relevant factors to the attention of the IMF country desk officers. We define country authorities to include both those representatives of the country's central bank and fiscal authorities whose function it is to interact with the IMF, and those members of the IMF Executive Board and their staffs who represent the country at the IMF.

⁴ For a description of the Global Projection Model, see Carabenciov and others (2013).

⁵ Five area departments together cover all IMF member countries: the African Department (AFR), the Asia and Pacific Department (APD), the European Department (EUR), the Middle East and Central Asia Department (MCD), and the Western Hemisphere Department (WHD).

B. Information Flows of the IMF Forecast Process

20. Figure 2 depicts the flows of information that occur during a typical *WEO* forecast round.⁶ Letter A in the figure represents the flow of information that results from the Initial Conditions Meeting. The Economic Modeling Division chairs this meeting to gather the information on initial conditions that it requires to produce a set of forecasts based on the Global Projection Model.⁷ Representatives of key country desks and regional departments provide information about important new policy initiatives and country and regional events that will affect economic conditions. The Research Department's Commodities Unit provides projections of future prices of key commodities; the FAD provides information about developments in fiscal policy; and the MCM provides information about interest rates and other important financial market conditions.



Note: Black lines represent flows of information that serve as inputs at various stages of the process. Blue lines represent the flow of forecast information produced by EMD with GPM. Red lines represent the flow of *WEO* forecasts. Each line segment is coded with a letter from A to O, whose meaning is explained in the text.

⁶ Figure 2 and the accompanying description center on information flows among different actors in the forecast process. They are not designed to convey the timing of these information flows. Aspects related to timing are discussed in Section C below.

⁷ These forecasts are not mechanical outputs from an econometric model. They incorporate judgments based on the information gathered at the Initial Conditions Meeting.

21. The letter B represents additional information that results from separate Research Department consultation with country desks and area departments. In many cases, the information obtained through these consultations has already been obtained through the initial conditions meeting but in some cases the consultations supply additional information that EMD uses to initialize the GPM. After gathering the required initial information, EMD uses the GPM to produce an initial set of forecasts for countries and groups that together account for about 87 percent of world economic activity as measured by GDP.⁸
22. The letter C represents the interaction between IDFC and EMD. EMD presents its initial GPM forecasts to the Committee and receives feedback from it on the reasonableness of those forecasts. The interaction can, though usually does not, lead to resetting initial conditions, rerunning the model, and revising the GPM forecasts.
23. The letter D represents the release of the GPM forecasts to WES. This occurs after IDFC has reviewed the GPM forecasts and after any revisions to the GPM forecasts have been completed. WES includes these forecasts, and other global initial conditions such as projected paths of prices of key commodities, changes in the fiscal stance of key countries, and changes in interest rates and other important financial market conditions, in a “global assumptions memo” which it sends to departments and country desks to initiate the *WEO* round (letter E).
24. The GPM forecasts are also sent to the Meeting on Surveillance Issues (letters J and L) to provide its participants a chance to give feedback to EMD on key assumptions underlying the forecasts.
25. In preparing their forecasts, country desks interact with country authorities with varying degrees of intensity, depending on the attention the authorities pay to the outcome of the forecast process and on the eagerness of the country desks to seek their input. The interaction takes place mainly during a country’s Article IV consultation but it typically continues throughout the year and intensifies during the *WEO* rounds. The flow of information often takes place through the office of the Executive Director who represents the country at the IMF. The letter F represents the two-way flow of information that results from these interactions.
26. Because IMF forecasts are produced by country economists, the red line, G, which represents the flow of *WEO* forecast information, begins at the country desk box. The line-G arrow is two-sided to represent the coordination that occurs between country desks and area departments to guarantee that the forecasts for countries within a department make sense for the department as a whole. For example, AFR will make sure that all relevant African

⁸ They include the Emerging Asia, Euro Area, Japan, Latin America, the United States, and a block of remaining countries.

country desks condition their forecasts on the same assumption about economic growth in South Africa. Similarly, WHD may compare the aggregate of individual forecasts with the forecasts contained in the global conditions memo and consult with country desks if the difference between the two seems unreasonably large.⁹

27. Letter H represents coordination between country desks/departments and WES to assure that *WEO* forecasts make sense when aggregated to produce forecasts for the world. For example, WES will check to make sure that the aggregated current account for the world that is implied by country desk forecasts is not too different from zero. WES will also compare the aggregated country desk forecasts to the global forecast produced by the GPM model and may ask departments and country desks to justify their differences.¹⁰

28. Taken together, letters G and H indicate that the production of *WEO* forecasts is an iterative process that begins and ends with country desks but that includes reviews and consistency checks conducted by departments and by WES. The checks and balances serve as a coordinating device to guarantee that the forecasts produced by country desks make sense when viewed from regional and global perspectives.

29. Once the iterative process is complete, reporting begins. Letter I represents the transmittal of forecasts by WES to Management, which in turn informs the Executive Board (letter L). The Executive Board is given an opportunity to comment on the *WEO* forecasts and analysis in an informal meeting that is held one to two months before the forecasts are released to the public. Revisions of the forecasts can be made after this meeting.¹¹ The Board is also informed about two weeks before the *WEO* is published. The release of the *WEO* generally takes place three days before the meeting of the International Monetary and Financial Committee (IMFC), at a press conference held by the Economic Counselor (Letter O).

30. It is IMF Management that conducts the final review of *WEO* forecasts. The Board discusses the forecasts but does not formally approve them before they are released to the

⁹ The type of coordination that takes place within each area department varies. For example, in the EUR it is carried out using a GPM-type model developed for the largest economies in that 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. As regional integration evolves, it is imperative that coordination across country desks within area departments adapts accordingly.

¹⁰ A number of other checks are also carried out by the *WEO* data unit 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 previous forecast or unusually large changes in the data.

¹¹ Timmermann (2006) analyzed these revisions and found that they generally resulted in considerable improvements in the accuracy of the forecasts.

public. It is also important to note that the GPM forecasts are released neither to the public nor to the Board.

C. Duration of the IMF Forecast Process

31. From beginning to end, the IMF forecast process requires several weeks, largely because the coordination built into the process is time consuming. As noted above, the forecast round entails two cycles—the GPM cycle and the *WEO* cycle.

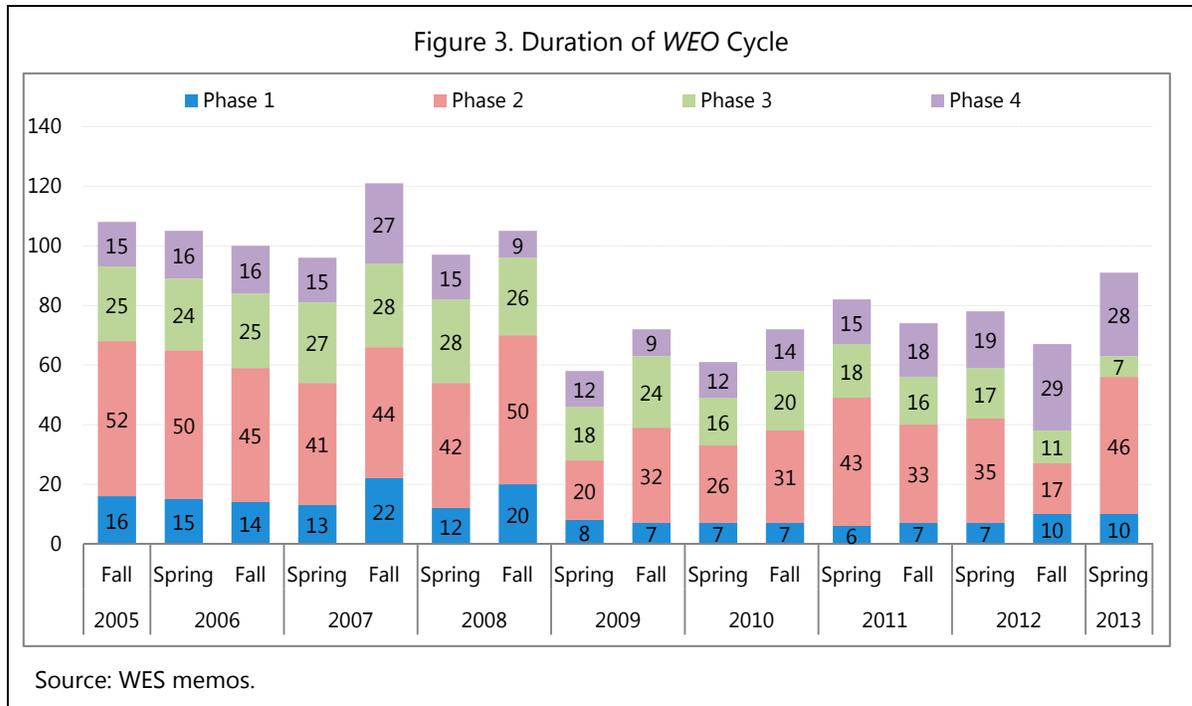
32. The GPM cycle typically takes about four weeks to complete. Just before week one, the GPM team prepares a preliminary forecast and releases an issues note to country desks. The Initial Conditions Meeting described in Section B above occurs at the beginning of week one. By the end of week one, EMD has produced an updated GPM forecast and has discussed a story line with the co-chairs of the Interdepartmental Forecast Committee. During week two, EMD discusses the forecasts and story line with selected country desks and prepares the first draft of its GPM report and sends it to the IFDC co-chairs. During week three, EMD prepares the final draft of its report and transmits it to the IFDC. Toward the end of week three, EMD presents its forecasts to the IFDC. During week four, EMD completes its GPM forecast report and presents it to the Meeting on Surveillance Issues.

33. The *WEO* cycle begins after EMD's presentation to the Interdepartmental Forecast Committee, which takes place about three weeks after the start of the GPM cycle. Since 2005, the main *WEO* cycle has taken between 60 and 120 days¹² (Figure 3). The whole cycle can be seen as having four phases. The first phase starts with the initial conditions memo issued by WES. During this phase, country desks prepare their initial forecasts and these are reviewed by area departments and WES. At the end of phase one all forecast submissions have been entered into the *WEO* data base. During phase two, a draft of the *WEO* including both the descriptive and analytical chapters is being prepared. We mark the end of this phase when the draft is presented to the Executive Board. During phase three, country desks revise their forecasts and the revised forecasts are reviewed, finalized, and submitted to WES.¹³ In phase four, the full *WEO* publication is revised. This phase ends when the *WEO* is released to the public.

34. The length of each phase has varied in recent years. As Figure 3 shows, before 2008 the *WEO* cycle required about 100 days to complete. Since then it has been shortened substantially, ranging between 58 days for the Spring 2009 cycle and 91 days for the Spring 2013 cycle. The shortening of the cycle coincides with the start of the *WEO* Updates. Most of the variation occurs in the review phases, especially in phase four.

¹² The *WEO* updates published in January and July take less preparation time, typically about 45 days.

¹³ Only Group A countries (see footnote 3) are required to submit revised forecasts at this stage.



35. Combining the preparation of the GPM forecasts with the *WEO* round, the IMF process takes about 80 days (3 weeks GPM = 20 + 60 days *WEO*) from start to finish. As discussed in Chapter IV below, a forecast round typically takes 40 working days at the OECD, about 60 at the EC, and about 14 at the FRB. Private sector forecasts typically take even less time—in some cases as little as a week.

36. Overall, then, the IMF process is quite long relative to those of other forecasters. Moreover, the shorter the preparation period the more recent will be the information on which the forecasts are based.¹⁴ This should be kept in mind when forecast accuracy is compared across institutions.

D. Comparison of the Article IV and *WEO* Forecast Processes

37. IMF staff produce forecasts for Article IV bilateral surveillance consultations as well as for the *WEO*. In many ways, the processes that produce these two forecast products are the same: both Article IV and *WEO* forecasts can be thought of as snapshots of a continuous forecast process used by country desk economists. The former involves greater interaction with country authorities and less top-down direction, whereas the latter contains substantial formal top-down elements to ensure global consistency. This section explains the differences.

¹⁴ The IMF tries to deal with this issue by having the desk economists for the most important countries update their forecasts two to three weeks before publication.

38. Article IV consultations can occur at any point in the calendar year and forecasts are produced for those consultations whenever they occur. If an Article IV consultation coincided with a *WEO* round, then the Article IV forecasts for the country in question would be identical to the forecasts for that country prepared for the *WEO*.¹⁵

39. When an Article IV consultation does not coincide with a *WEO* round, the country desk economist updates the most recent country forecast, based on discussions with, and data received from, country authorities during the Article IV mission. In creating the Article IV forecast, he does not automatically have the benefit of new GPM forecasts or a new memo on initial conditions, although more recent GPM forecasts can be accessed. The Article IV forecast is also not subject to aggregation checks, simply because most other country desks are not producing forecast updates at the same time. However, the area department still reviews the individual forecasts.

40. There is one other way in which the Article IV forecast process differs from that for the *WEO*. In the *WEO* process, the IMF Executive Board receives a report on the *WEO* before it is released to the public but does not officially approve that report, which is considered a staff document. In the Article IV bilateral surveillance process, the IMF Executive Board is asked to broadly endorse the staff appraisal contained in the Article IV report prepared for each country consultation. The staff appraisal is based in part on the forecasts produced for the economy.

III. MULTI-COUNTRY FORECASTING: CHALLENGES AND SOLUTIONS

41. Forecasting macroeconomic activity for more than 180 economies is more complex than producing such forecasts for a single country.¹⁶ Not only is the number of economies involved very large, but each of them has trade and financial linkages with many others, which means that forecasts need to be coordinated. Moreover, economies differ from each other for structural, geographical, and geopolitical reasons, implying that approaches to forecasting need to be tailored to individual circumstances. A further challenge is that for many economies, there exist relatively few macroeconomic data and relatively few in-country resources devoted to quantitative macroeconomic analysis. Forecasts of economic developments in such cases must be based almost completely based on the judgment of the forecaster. In this chapter we explain how the IMF and other forecasters deal with these challenges.

¹⁵ Indeed, for G7 countries, Article IV consultations are now scheduled to coincide with *WEO* rounds; 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.

¹⁶ The number of economies for which the IMF produces forecasts has evolved over time as the number of IMF members has increased. In 2013, separate forecasts were produced for 186 out of the 188 members; Palau and Somalia were excluded. In addition, forecasts were produced for non-members such as Hong Kong SAR and Taiwan Province of China.

A. Challenges and Solutions at the IMF¹⁷

(i) Bottom-up versus top-down forecasting

42. The first and most difficult challenge is to develop a forecast procedure that includes the important benefits of both “bottom-up” and “top-down” approaches. A pure bottom-up approach would leave country specialists free to base forecasts on their detailed understanding of country-specific economic conditions and mechanisms without imposing constraints on those forecasts that derive from a “centralized view” of the economic outlook. Such an approach would also allow country specialists to assign whatever weight they deem appropriate to the views of country authorities and in-country forecasters.

43. The pure bottom-up approach provides important benefits to the forecasting process. It places the job of forecasting in the hands of country experts who, for example, often better understand how changes in commodity prices will affect economic growth in the economy they are responsible for, whether promised changes in policies will come to fruition, whether idiosyncratic events will interrupt economic activity, or how changes in popular attitudes will translate into changes in spending and employment outcomes. The pure bottom-up approach frees the country expert to use whatever depiction of economic activity seems best suited to capture the essential features of economic decision making in the country even if it is very different from models used by other experts to explain other economies.

44. The pure bottom-up approach also entails potential sources of inconsistency. It allows country specialists to make their own assumptions about worldwide economic conditions such as growth rates in the G7 and could thus introduce variation in country forecasts that is due to disagreement about worldwide economic conditions. A mechanism that coordinates views about worldwide economic conditions helps to remove such variation from country-level forecasts and to inform country desks about changes in other regions/countries and increase awareness of global conditions that have an influence on the country.

45. A second cost of the pure bottom-up approach is the absence of checks and balances. Aggregating forecasts for countries in a region and for regions in the world is one way to obtain regional and global forecasts of economic conditions. A system of checks and balances asks whether the implied regional and global economic forecasts make sense when viewed from regional and global perspectives: for example, whether the implied global forecasts are consistent with global forecasts based on aggregated data; whether aggregated current account balances are sufficiently close to zero that any departure could be attributed

¹⁷ We focus on challenges that are particular to a multi-country context. This means in particular that we are not dealing with issues related to data management. While these are extremely important and formidable given the large number of countries and data series involved, the challenges involved are not fundamentally different from those faced by a manager of data for a single country. Questions related to data quality and integrity are being studied in another IEO evaluation.

to measurement error; whether imports of country *i* from country *j* are at least roughly equal to exports from country *j* to country *i*; and whether observed cross-country correlations in realized measures of economic growth are present in forecast measures of economic growth.

46. A pure top-down approach uses one model or a set of linked models to generate forecasts for all countries and regions. The top-down approach, too, entails benefits and costs. The pure top-down approach ensures that all forecasts are conditioned on identical assumptions about changes in variables that are exogenous to specific countries. It also guarantees that aggregation restrictions on global current accounts and forecast co-variances are satisfied. It insures that all country forecasts are conditioned on identical assumptions about growth in the economic locomotive nations. The costs of the pure top-down approach are also important. It is a considerable challenge both technically and conceptually to build and estimate a system of interlinked country models unless the number of countries or regions is relatively small. Mechanisms and conditions that are important in only a few nations would likely be ignored in the interest of parsimony. And it would be extremely difficult to incorporate into the model country-specialist insights that are based on specific characteristics of a given country.

47. An understanding of benefits and costs associated with the pure bottom-up and top-down approaches to global forecasting suggests that some combination of the two approaches is desirable. But a number of issues must be addressed before a hybrid approach can be created. Which regions and/or large economies should be included in the top-down model that is used to guide and coordinate forecasts? What should be the criteria for deciding whether to model a country or a region separately or combine it with another? How should the hybrid process combine bottom-up and top-down information to produce a final set of forecasts? Should top-down regional forecasts be used only as guides to the production of bottom-up forecasts or should they rigidly constrain the bottom-up forecasts?

48. As explained in Chapter II above, the IMF has incorporated important elements of both the bottom-up and top-down approaches in its forecast process. The *WEO* process is fundamentally bottom-up in the sense that country desks are responsible for producing forecasts for their countries incorporating whatever information they deem most relevant. If a country desk economist believes that idiosyncratic events and conditions will play large roles in the economic future of her country, she is free to make forecasts that are consistent with her views. Country desk economists are also free to incorporate as much or as little of the views of country authorities or in-country forecasters as they deem appropriate. Of course, if the forecast is viewed as implausible by WES or by the economist's superiors in the corresponding IMF area department, or by the Executive Director or country authorities, pressure may be exerted on the desk economist to either justify or reconsider it. Whether this will lead to a change in the forecast depends on the strengths of the convictions of those on each side of the argument.

49. The *WEO* process is top-down in the sense that EMD uses the GPM to forecast economic activity for the United States, the Euro Area, Japan, Emerging Asia, Latin America, and a block of remaining countries and provides those forecasts to WES and to all country desks. Thus, all country desks receive the same model-based forecasts for economic activity in the six country groups that together account for about 90 percent of world GDP. The *WEO* process is also top-down in the sense that WES provides all country desk staff with a “global assumptions memo” that provides information about new policy initiatives, important economic events, future prices of key commodities, changes in the fiscal stance of key countries, and changes in interest rates and other important financial market conditions. WES asks country desk staff to base their forecasts on the information contained in the “global assumptions memo.”

50. Any process that combines bottom-up and top-down approaches to forecasting faces a coordination problem: how to converge quickly enough to produce forecasts that are timely and useful? The *WEO* process achieves coordination through two separate mechanisms. First, at the Initial Conditions Meeting, information from area departments and key-country desks is provided to EMD, to allow the division to set the initial conditions for its GPM forecasts. In addition, IDFC reviews the GPM forecasts before they are transmitted to WES and country desks. While the Committee’s review typically does not lead to a revision of the GPM forecasts, it could and presumably would if Committee members became aware of new regional or country-specific information that warranted such a revision.

51. The second coordinating mechanism is the review of both GPM and country desk forecasts by MSI and subsequently by IMF Management. Country desks, area departments, and WES all understand that MSI and Management may compare the two sets of forecasts and could demand explanations if the two differ greatly. Thus, EMD has an incentive to listen carefully to the views of country desk economists as communicated by IDFC, and country desk economists have an incentive to listen carefully to requests by area departments and WES to revise their forecasts when they are collectively out of line with GPM forecasts.

(ii) Conditioning assumptions

52. A second challenge for agencies that produce global forecasts is what to assume about exogenous background conditions including monetary and fiscal policies that will affect economies during the forecast period. Earlier, we pointed out that the top-down aspect of the IMF forecast process includes a meeting to determine the initial conditions that underlie the GPM forecasts, which are coordinated with the main country desks and communicated to all country desk economists. The initial conditions include information about important new policy initiatives and country and regional events that will affect economic conditions, future prices of key commodities, changes in the fiscal stance of countries, and changes in interest rates and financial market conditions. The IMF includes an explicit statement about background conditions in the *WEO*. Background conditions also include assumptions about monetary and fiscal policy during the forecast period.

53. If a forecaster is a disinterested observer of economic conditions, it might be reasonable to use available information to simultaneously forecast monetary policy, fiscal policy, and economic outcomes. Put another way, the disinterested observer would use available information to make a “best guess” about monetary and fiscal policy over the forecast horizon.

54. The IMF is not a disinterested observer of economic conditions, however. In particular, for a country that has obtained Fund resources in the context of an adjustment program the authorities and the IMF have negotiated policy changes that the country agrees to undertake. The IMF faces a potential conflict of interest when it forecasts future economic conditions in such cases. As an agency that seeks to produce accurate forecasts, the IMF would make the most accurate forecast possible about the country’s future monetary and fiscal policy decisions whether or not those decisions would fulfill the terms of the IMF program. As the agency that seeks to remedy international financial crises, the IMF would indicate confidence in the program by basing its forecasts for the program country on the assumption that the country will satisfy the terms of the program. Currently, forecasts for countries with IMF-supported programs are conditioned on the assumption that agreed-upon policies are implemented and/or maintained during the forecast period.¹⁸

55. For non-program countries, it is generally assumed that established policies will be maintained during the forecast period, and only policy changes that have already been legislated are taken into account in the forecast. The *WEO* typically contains a description of its policy assumptions about the largest economies.¹⁹

(iii) Communicating forecasts

56. A third challenge is what sort of information to present in the forecast report. In particular, should point forecasts be presented in isolation or as part of a distribution of potential outcomes? Presenting point forecasts alone may create a false impression about the precision of forecasts—which is a reason why many central banks, for example, routinely publish forecasts in terms of fan charts or similar illustrations of the uncertainty surrounding the point forecast.

57. Presenting forecasts as distributions creates particular technical difficulties in a multi-country context. Forecast distributions for each country are not independent from each other in view of trade and financial linkages. The distribution of forecasts of any one country will depend on uncertainties resulting not only from domestic shocks but also from regional and global shocks. The coordination effort needed to make forecast distributions consistent across

¹⁸ IMF staff whom we interviewed pointed out that if the IMF truly believed that a country could not fulfill the terms of an IMF program, then it ought to renegotiate the terms of that program.

¹⁹ See pp. 144–47 of www.imf.org/external/pubs/ft/WEO/2013/01/pdf/text.pdf for an example.

all member countries would thus be momentous and excessively time consuming. Furthermore, in contexts where forecasts are made primarily using judgment rather than a formal econometric model, it may be too much to ask a forecaster to articulate a numerical forecast distribution.

58. The IMF has addressed this issue pragmatically. The statistical tables in the *WEO* that cover all countries and regions for which forecasts are computed contain only point forecasts. However, analysis in the *WEO* regularly contains discussions about risks faced by the global economy. Typically included in this analysis is a fan chart that gives the forecast distribution around the *WEO* baseline forecast for global growth. Risk scenarios are also frequently discussed with reference to deviations from the *WEO* baseline forecasts.²⁰

B. Practices at Other Organizations²¹

59. One way to gain perspective on the IMF forecast process is to consider how global forecasting is undertaken by other international agencies and in the private sector. This section describes the forecast processes at the Federal Reserve Board, the OECD, the Asian Development Bank (ADB), the EC, and three global investment banks. It also highlights relevant differences between those processes and the IMF forecast process.

60. 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 member countries and for the BRIICS group (Brazil, Russia, India, Indonesia, China, and South Africa). Like the IMF it also produces two updates to these forecasts. Each of its major forecast rounds takes 40 working days. The top-down approach is initiated in the OECD's Macro-Economic Policy Division (MPD), which prepares forecasts for the G7 countries for the current and next quarters using an indicator model. These forecasts form the basis of a general discussion after which OECD directors issue strong guidelines for country desks to follow in making their forecasts.

61. Among the official institutions we reviewed, 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 forecast process occurs eight times a year and each forecast takes two weeks. FRB forecasters are largely unconstrained in the construction of forecasts. While the FRB's Trade and Quantitative Studies section provides forecasters with oil price forecasts based on futures

²⁰ Unlike the *WEO* point forecasts for the global economy or for regional groupings, which are based on aggregation of forecasts for individual countries, the fan chart and the deviations around the *WEO* baseline are based on simulations of the GPM or some other econometric model particularly suitable for the scenario at hand. The simulations produce deviations from the model baseline and these deviations are applied to the *WEO* baseline forecasts.

²¹ For more details on the approaches adopted in other organizations, see the Annex.

data, it does not provide them with model-based forecasts. In general, FRB forecasts are not required to satisfy any adding-up constraints, although occasionally they may be asked to reconsider when the implied current account balance for the U.S. seems out of line.

62. The EC is more like the IMF in that country desk economists are provided with 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 they are not strictly constrained by these when they prepare their own forecasts. The ADB also follows a mixed approach, giving a large amount of autonomy to its country desk economists.

63. 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 where each country forecast is scrutinized and commented upon by peers.

64. What may explain the differences between institutions in their approaches? Two factors are particularly relevant. First, frequency is crucial: a largely bottom-up approach is almost inevitable for global investment banks that produce forecasts every other week.²² If timeliness is not the main purpose of the forecast, a more inclusive iterative process can be considered in which country, regional, and global perspectives are brought to bear. Second, homogeneity of the countries that are being forecast may tip the balance towards a more centralized approach: when most of the countries being forecast are affected by common factors, it is justified to take a top-down view, as at the OECD, and not let country desk economists deviate extensively from that view. For the IMF, by contrast, which has to produce forecasts for countries with vastly different economic structures, an approach where idiosyncratic factors are allowed to influence country forecasts is more suitable.

65. Based on the criteria just discussed, our view is that the process currently followed by the IMF is appropriate. As noted, the Fund produces forecasts for a large number of heterogeneous countries, which precludes a highly centralized approach. But it is also required to produce a coherent view about the world economic outlook, and this necessitates a well structured coordination mechanism that brings together country-specific knowledge with a global perspective. We believe that the *WEO* process does so.

66. How accurate are IMF forecasts compared to those made by other agencies, and how well do IMF forecasts reflect interconnectedness among member countries? The evidence in Freedman (2014) and Genberg and Martinez (2014b) suggests that *WEO* forecasts perform reasonably well in these respects.

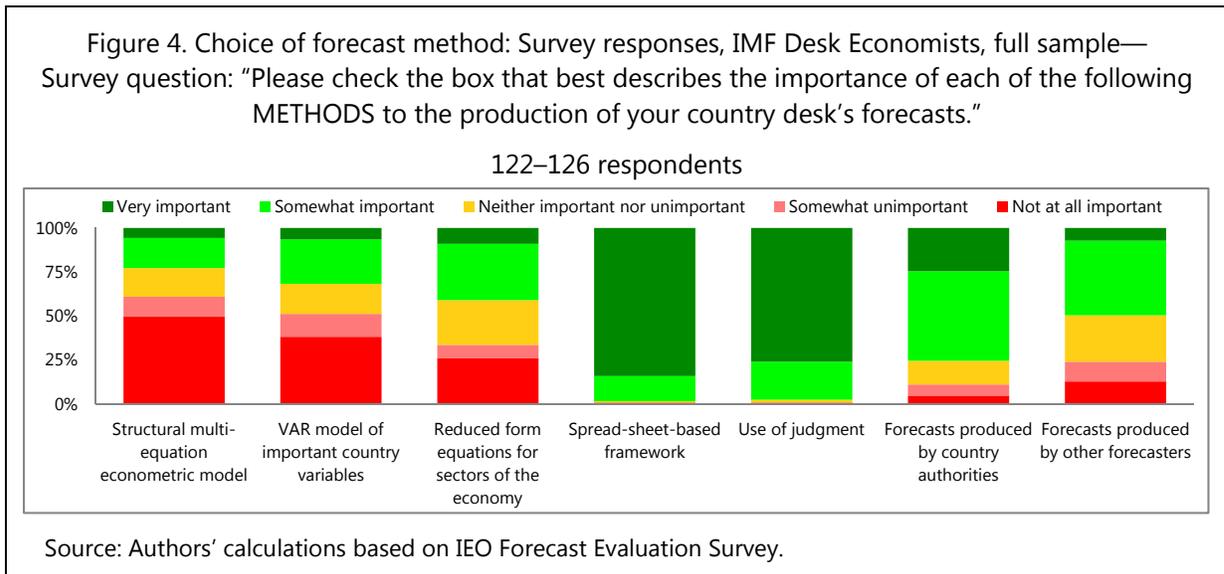
²² For reasons we have explained above we exclude the possibility of having a single centralized model for all economies. Such a model could in principle produce forecasts at a high frequency but their reliability would be doubtful.

IV. HOW COUNTRY DESKS PRODUCE FORECASTS AT THE IMF

67. Here we use results from a survey of country desk economists to describe how they produce their forecasts, how they make their decisions to use some strategies rather than others, and how their decisions vary depending on country characteristics.²³

A. Choice of Forecast Method

68. Figure 4 reports responses by the full sample—between 122 and 126 individuals—of respondents to the IEO’s Country Desk Staff Survey. It shows that that the spreadsheet framework, personal judgment, and the forecasts produced by country authorities are used much more widely in the production of *WEO* and Article IV forecasts than are methods based on more formal analysis. This result proved robust to grouping countries by departments, by country income, by whether or not countries currently had an IMF-supported program, and by whether or not countries were commodity exporters.



69. Because survey respondents indicated that the use of a spreadsheet framework was a very important forecasting method, we include a brief description of that framework. The IMF Macro Framework, formerly termed the Financial Programming Framework, is a set of relationships built into a spreadsheet which helps the country desk economist organize information and forecasts. The relationships jointly describe a country’s flow of funds. The equations primarily consist of macroeconomic accounting identities but may also include a small number of behavioral equations and arbitrage conditions. The framework provides flow-of-funds equations for a country’s national accounts, balance of payments accounts,

²³ For a detailed description of the survey, the survey process, and the respondent groups, we refer the reader to Genberg and Martinez (2014a).

fiscal accounts, and monetary accounts. The sectors specified in the framework are the government, non-government sectors, and financial sectors and the rest of the world.

70. From post-survey interviews about how the Macro Framework is used in the forecast process, we find that applications of the framework are very country specific. In some cases “satellite” models are used to forecast certain parts of the spreadsheet, but in others numbers are entered based on judgment with varying degrees of sophistication. In some cases, behavioral relationships are used to link different sectors in the framework, but in others not. The Macro Framework itself provides a cross-sectoral consistency check of forecasts. Interviewees emphasized that it is important for country desk economists to have a narrative in mind for forecasts.

71. Post-survey interviewees also mentioned that country desk economists’ forecasts are often quite similar to forecasts from Consensus Economics,²⁴ which publishes aggregates of private sector forecasts. Several interviewees noted that there are incentives for a desk economist not to deviate from Consensus forecasts. Doing so can lead to demands from the division chief to justify the deviations—demands that may stem from having to justify the deviations to the front office of the department. Not wanting to rock the boat may thus lead staff to adjust their forecasts towards the Consensus forecast.

72. There need be nothing inappropriate in requests for justification in cases where forecasts deviate from the consensus in the private sector. Such requests would constitute a check on whether the reasoning behind the departure from the consensus is valid. On the other hand, a generalized pressure to conform could lead Fund staff to excessive caution in their forecasts and hence a failure to articulate potential upside or downside variations.

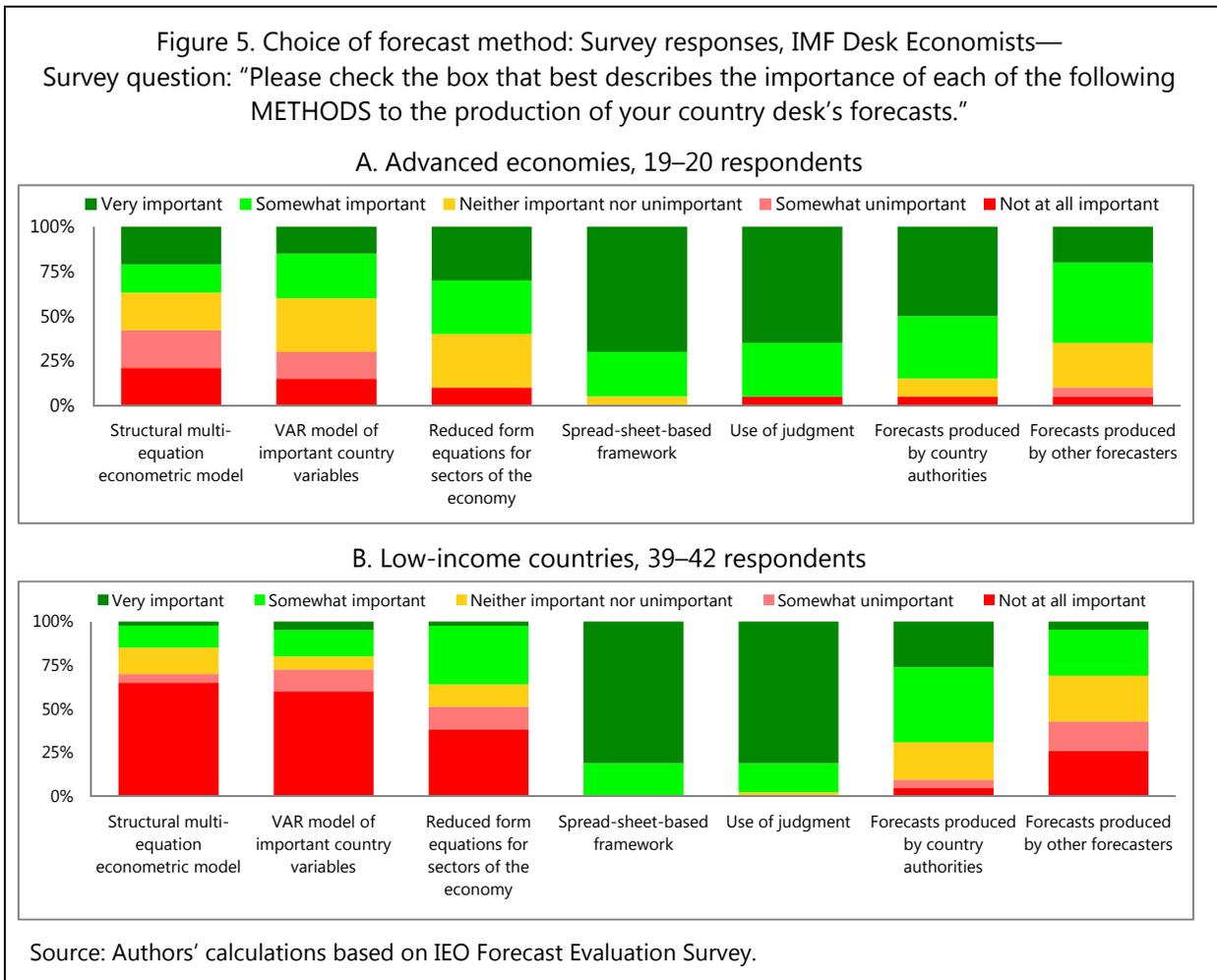
73. In his evaluation of *WEO* forecasts, Timmermann (2006) included an assessment of whether *WEO* forecasts contain “Too Much (or Too Little) Consensus.” His conclusions seem to suggest that the staff economists’ perceived incentives not to deviate from Consensus forecasts have not led to serious deterioration of forecast performance, at least as of 2006:

“For four of seven G-7 economies, there is evidence that current-year *WEO* forecasts of GDP growth can be slightly improved by pushing them further away from the Consensus values. Gains from doing this are very modest, however. There is no evidence that the next year GDP forecasts can be improved in this manner. Nor is there any evidence that such a strategy works particularly well for the Latin American economies, although the converse strategy of combining the two sets of current-year forecast appears to work well for the Asian economies.

Very interesting results emerge for the next-year inflation forecasts where large gains can be obtained by pulling the *WEO* forecasts strongly towards the Consensus values...” (Timmermann, 2006, pp. 44–45.)

²⁴ www.consensuseconomics.com/

74. Figure 5 shows how responses to the forecast-method questions differed between desks that cover advanced economies and those that cover low-income economies. In both groups, the “spreadsheet method” is considered important or very important by virtually all of the desks and “forecasts produced by country authorities” are considered important by most of the desks. Economists covering low-income countries are far more likely to rate structural models, VARs (vector auto regressions), and reduced form methods as “not at all important” than are desks covering advanced economies. Also, desks that cover low-income countries are more likely to rate forecasts produced by other forecasters as “somewhat unimportant or not at all important” than are desks covering advanced economies.

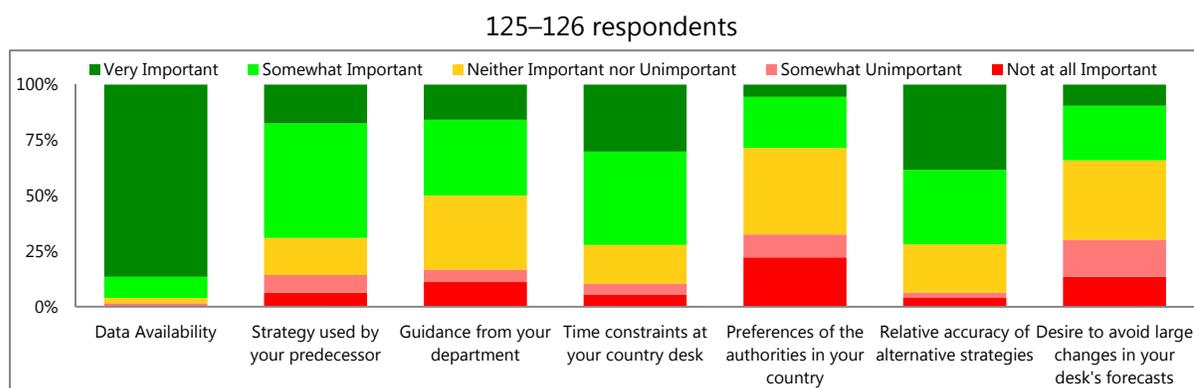


B. Reasons for the Choice of Forecast Method

75. Asked why they had adopted a particular forecasting method, virtually all respondents indicated that data availability was an important factor in their choice, and about 75 percent of respondents indicated that time constraints were also important (Figure 6). However, only 50 percent of the respondents from low-income countries and AFR desks indicated that time

constraints were an important consideration.²⁵ These responses are not surprising because academic econometric work that underlies forecasting with technical methods has tended to focus on advanced rather than low-income countries, and because advanced economies are more likely to have forecasts produced by government and private sector forecasters. Data required for the use of sophisticated econometric forecasting techniques are also less likely to be available in low-income countries than in advanced economies.

Figure 6. Reasons for choice of forecast method: Survey responses, IMF Desk Economist, full sample— 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.”



Source: Authors' calculations based on IEO Forecast Evaluation Survey.

76. Consistent with the previous result, about 75 percent of respondents indicated that the strategy used by the desk officer's predecessor was an important consideration in choosing a forecast method. We explored this choice further in post-survey interviews with economists. One question asked in these interviews was whether information was passed along efficiently between successive desk economists. Paraphrasing slightly, the answers ranged from “An enormous amount of information is lost” to “My predecessor was very helpful in explaining the spreadsheet, models, and important sources of judgmental information used for the forecasts.” A common theme was that the efficiency of the process of passing information is highly dependent on personalities, and that some more formal system would be desirable.

77. Returning to the survey results, Figure 6 shows that about 75 percent of respondents indicated that forecast accuracy was an important consideration in the choice of a forecast method. Desk economists from Europe and Africa were less likely to respond in this way. Interestingly, country desk economists were less likely to respond that a desire to avoid large changes in forecasts was an important consideration. This suggests they believe that large changes in forecasts, when these occur, are justified by changes in country conditions.

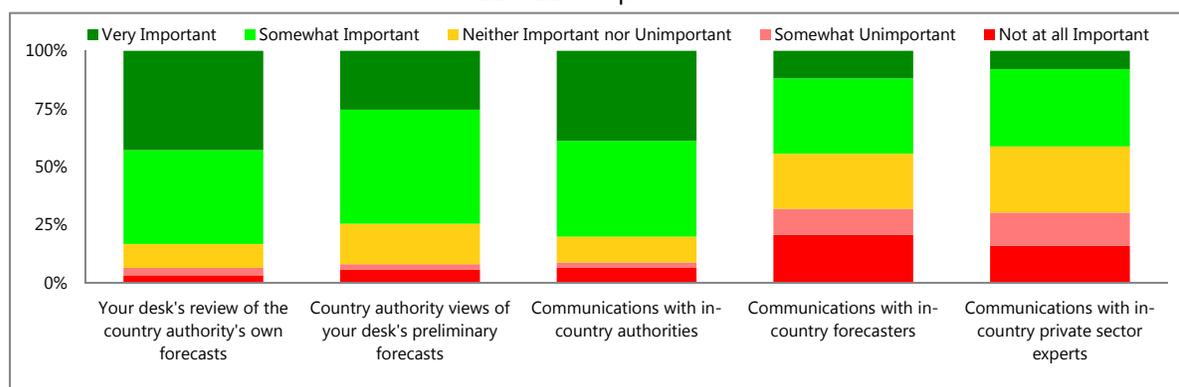
²⁵ To conserve space, the paper does not display most response distributions for sub-groups of respondents. Sub-group distributions are available in Genberg and Martinez (2014a).

C. Interactions with Country Authorities

78. How important are interactions with country authorities for the production of IMF forecasts? A large majority (87 percent) of country desks indicate that interactions with country authorities are somewhat important or very important (Figure 7), although this proportion decreases to 25 percent among desk economists for advanced countries.

Figure 7. Interactions with country authorities: Survey responses, IMF Desk Economists, full sample—Survey question: “Please rate the importance of each of the following country authority interactions for your forecasts.”

125–126 respondents



Source: Authors' calculations based on IEO Forecast Evaluation Survey.

79. Overall, the results of the survey support the conclusion that country desk economists rely much more heavily on spreadsheet-based analysis, judgment, and forecasts produced by country authorities and other forecasters than they do on model-based and econometric methods. This is true even for desks that cover advanced economies, although the more technical approaches are more likely to be employed at advanced-economy desks than at others. Country desk economists indicate that the availability of data, the methodology chosen by previous staff, and time constraints are important factors in their current choices of forecast strategies. They also indicate that forecast accuracy is an important consideration—a point to which we return in the next chapter. The vast majority of survey respondents consider the views of their country authorities to be important inputs to their forecasts, but only about 40 percent of respondents consider that communications with private sector experts and forecasters are important to the production of their forecasts.

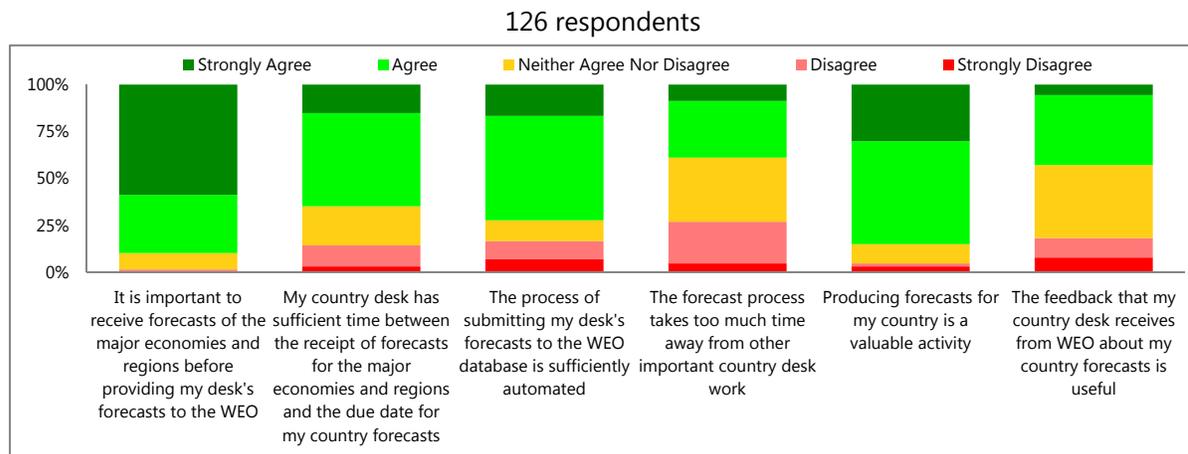
V. PERSPECTIVES ON THE IMF FORECAST PROCESS

80. In this chapter we apply the survey findings to assess aspects of the IMF forecast process. We are interested in the views not only of IMF country desk staff members but also of member country authorities and private sector forecasters.

A. Perspectives of Staff

81. As shown in Figure 8, the great majority of respondents agree that it is important to receive forecasts for the major economies and regions before making their *WEO* forecasts. This finding suggests that country desk economists believe that the top-down element of the *WEO* process is valuable for their own country forecasts.²⁶ However, only a slight majority of these staff members agree that they have sufficient time between the “receipt of forecasts for the major economies and regions” and the “due date for my country forecasts.” Staff of Advanced Economy and European desks are less likely to agree that they have sufficient time than other groups. Follow-up interviews revealed that a reason for this could be that many of these economists have to engage in work related to G-20 meetings which takes up considerable time. Nevertheless, the great majority of respondents agree that the forecast process is sufficiently automated, and the response distribution is similar for all country groupings.

Figure 8. Opinions on the IMF forecast process: Survey responses, IMF Desk Economists, full sample— Survey question: “Please rate your agreement with each statement below based on your views about how IMF country forecasts are produced.”



Source: Authors' calculations based on IEO Forecast Evaluation Survey.

82. Responses to the statement that the forecast process takes too much time away from important country desk work vary widely: overall, about 30 percent of respondents agree or strongly agree, about 25 percent disagree or strongly disagree, and about 45 percent neither agree nor disagree. Advanced Economy desks are more likely to agree and Emerging Economy desks are more likely to disagree. In contrast, however, a very large majority of

²⁶ This finding is robust to grouping countries by income, departments, whether or not they have programs, or whether or not they are commodity exporters.

respondents either strongly agree or agree that “producing forecasts for my country is a valuable activity;” this finding holds for all the country groupings previously described.

83. Further perspectives on the variation in these answers were obtained in the post-survey interviews. A number of interviewees expressed the view that producing well considered forecasts is essential for being able to make policy recommendations and that the time spent on the forecast process is well worthwhile. Others felt, however, that devoting more time to forecasting would not necessarily yield much improvement in the forecasts. Some staff members expressed some frustration that producing good forecasts did not receive the kind of recognition it deserved. They noted that staff performance in forecasting was not evaluated in the annual performance review, and that to improve one’s chances for promotion it was better to spend time writing research papers than producing good forecasts.

84. Asked about the feedback they received in response to their forecasts, country economists are divided in their views. As shown in Figure 8, about 40 percent of the survey respondents agree or strongly agree that “The feedback that my country desk receives from *WEO* about my country forecasts is useful;” about 20 percent disagree or strongly disagree; and about 40 percent neither agree nor disagree. Advanced Economy and European desks are more likely to disagree or strongly disagree. Interestingly, the distribution of responses for program country respondents is similar to the distribution across the full sample. Post-survey interviews revealed that most interlocutors appreciated the part of the feedback that consisted of checks on the accuracy and consistency of the data. Some also noted that they would appreciate more feedback on forecast methodology, including how economists covering other economies with similar features proceed.

85. Most interviewees who expressed a view on the matter felt that the migration to the new DMX system for organizing the Excel spreadsheets containing desk economists’ data for the country had improved the interaction with the *WEO* team and in general had been useful. Others felt that the migration was time consuming and that including historical data in the process was a waste of time.

86. As reported earlier, a large majority of country desk survey respondents indicated that forecast accuracy was an important consideration in their choice of a forecast method. Yet formal tests of forecast accuracy are not routinely carried out on an ongoing basis (Table 1A). About 45 percent of all respondents indicated that an analysis had not been conducted during their tenure on their desk. Slightly fewer than 15 percent responded that they had analyzed forecast errors at least once, and roughly a quarter indicated that they analyze forecast errors once a year or after each forecast round. Economists on Advanced Economy desks analyze forecast errors more frequently than these average figures, and those working on Emerging and Low Income economies analyze forecast errors less frequently.

Table 1A. How often does your desk conduct a statistical analysis of the forecast errors for your country? (in percent of respondents)		Table 1B. To assess the performance of the forecasts for my country, my country desk compared its forecasts to... (in percent of respondents who have conducted a statistical analysis)	
	Share		Share
During every forecast round	17.60	Actual Outcomes	96.23
Once a year	11.20	Forecasts made by my country authorities	62.26
At least once since the beginning of my current country-desk assignment	13.60	Forecasts made by private forecasters	24.53
Not since the beginning of my current country-desk assignment	45.60	Forecasts made by other multinational institutions	28.30
Don't Know	12.00	Forecasts produced by other models	9.43

Source: IEO Forecast Evaluation Survey of IMF country desks.

87. We asked our post-survey interviewees about conflict between the perceived importance of forecast error analysis and the infrequency with which that analysis is conducted. Some interviewees were surprised by the notion that forecast error analysis is important in the choice of forecast method, because they believed that this choice is based mainly on what the previous desk officer had used. Interviewees suggested that there is a lot of inertia in the forecast process and that the introduction of new approaches requires the assignment to a country desk of someone with the skills required for that approach.

88. Those who indicated that they do analyze forecast errors were asked a follow-up question about the methods they use to conduct their analysis. Table 1B reports the distribution of responses for the full sample. Comparing forecasts to outcomes is by far the most common method followed by comparisons with country authorities' forecasts. Very few respondents compare their forecasts with those produced using other models.

89. In follow-up interviews, many IMF staff indicated that having a regular analysis of their forecast errors would be useful. While several staff indicated that they have informal discussions with authorities about forecast errors in the context of Article IV consultations, these discussions were rarely recorded in the subsequent staff report. Staff thought that conducting a more regular and formal analysis of the past forecast errors could be useful but expressed mixed views on whether it should be mandatory. A few were concerned that it might turn into an "exercise of pointing fingers."

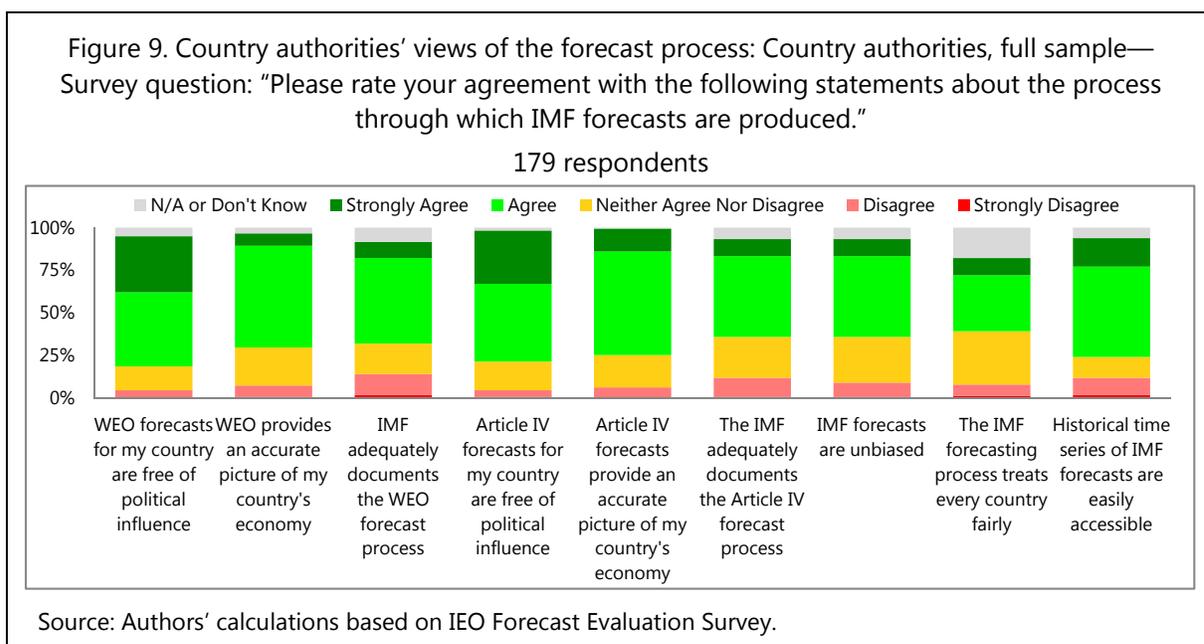
90. Several Executive Directors have expressed a desire for more analysis and explanation of forecast errors by IMF country desks.²⁷ Recently, the IMF has started to move

²⁷ In a Board discussion of an Article IV report an Executive Director made the point as follows: "we wonder whether the Fund projections and assessments in Article IV reports have ever been seriously tested for the accuracy of marksmanship. One simple mechanism of achieving such transparency is to have as part of the tables on selected economic indicators for the countries a comparison of the projections made by the Fund and country authorities for previous years as against the actual figures. Such a table could also throw up signs of any
(continued...)"

in this direction. For example, its most recent guidelines on Debt Sustainability Analysis for Market Access Countries, which will be implemented in late 2013, say that for a “high scrutiny” country the analysis should include a comparison of the forecast track record for that country relative to the forecasts for all other market access countries.

B. Perspectives of Country Authorities

91. Country authorities were asked to assess various aspects of the IMF forecast process. As shown in Figure 9, more than 75 percent of those who responded either agree or strongly agree that *WEO* and Article IV forecasts are free of political influence, and fewer than 5 percent of respondents disagree with this statement. These two findings hold for both *WEO* and Article IV forecasts. In addition, large majorities of country authority respondents agree or strongly agree that IMF forecasts provide an accurate picture of their country’s economy in both the *WEO* and Article IV context.²⁸ But only about half of the respondents agree or strongly agree that the forecasting process treats every country fairly.



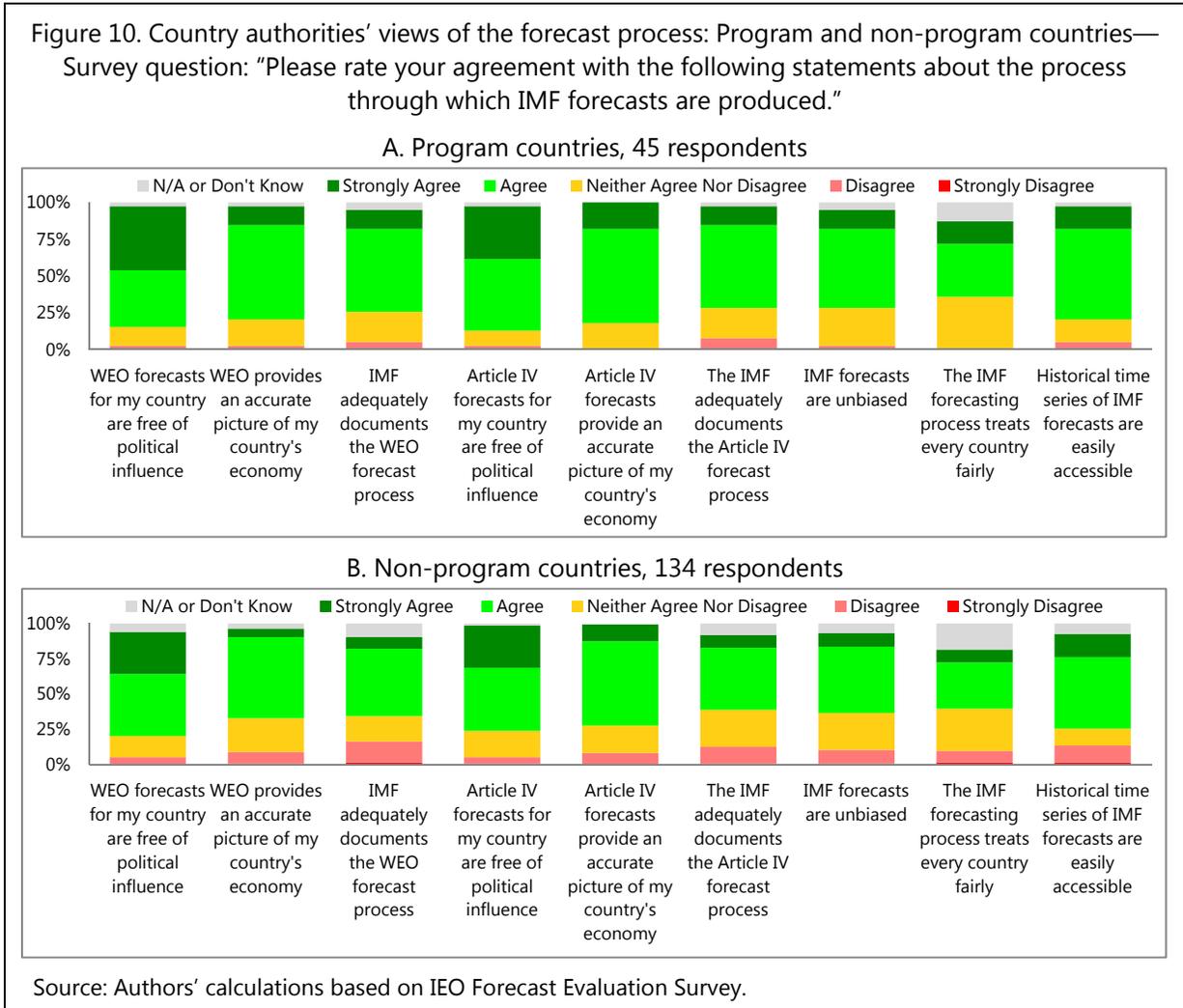
92. These findings suggest that country authorities place substantial confidence in the integrity of the IMF forecast process. This conclusion is supported by the fact that very small

systematic upward or downward bias in the projections and greatly add to internal transparency of Fund documents.”

²⁸ It is interesting to compare these responses to those from IMF desk economists when they were asked what they thought country authorities’ views would be. A smaller percentage (61 percent) of all desk economists (54 percent of desk economists working on emerging market economies) thought that “their” country authorities would view IMF forecasts as free from political influence.

fractions of respondents disagree or strongly disagree with the statements that IMF forecasts are unbiased and that the IMF forecasting process treats every country fairly.

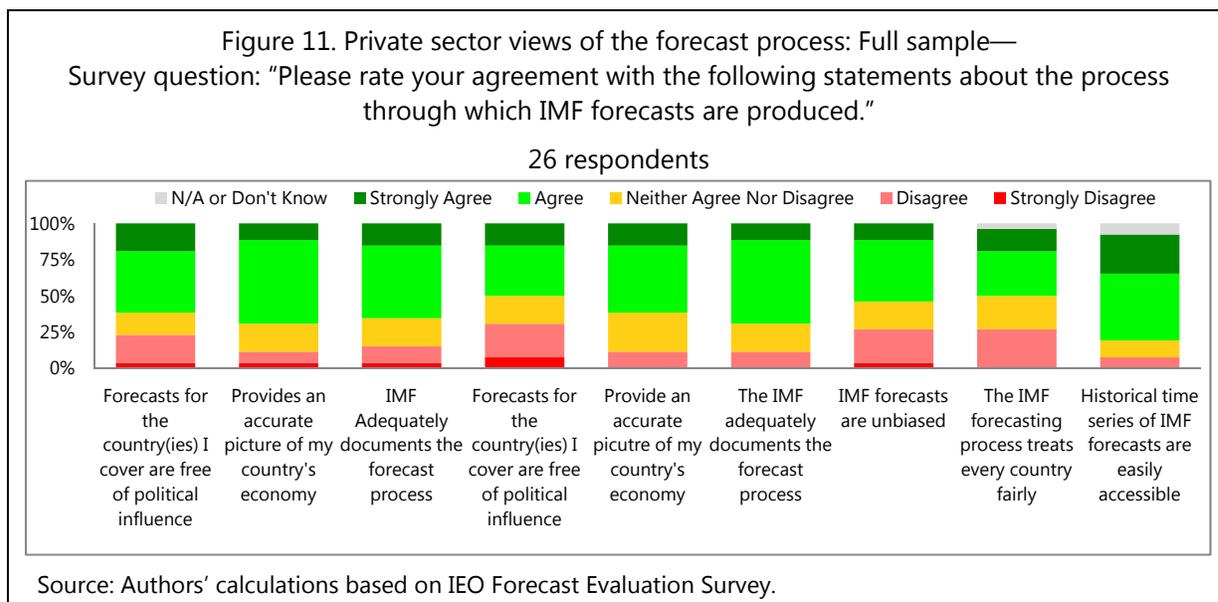
93. These findings are robust to country groupings, although the frequency of negative responses is a little higher for program countries (Figure 10).



94. Figures 9 and 10 provide little evidence that the IMF has inadequately documented its forecast process. Yet they are at odds with comments made in interviews with the evaluation team by several Executive Directors to the effect that the forecast process at the IMF was like a “black box,” an opinion echoed by some staff in post-survey interviews.

95. Private sector respondents are less inclined than Fund staff or country authorities to think that IMF forecasts are free of political influence, that they treat every country fairly, or

that IMF forecasts are unbiased. But in other aspects the private sector responses are quite similar to those of the country officials (Figure 11).²⁹



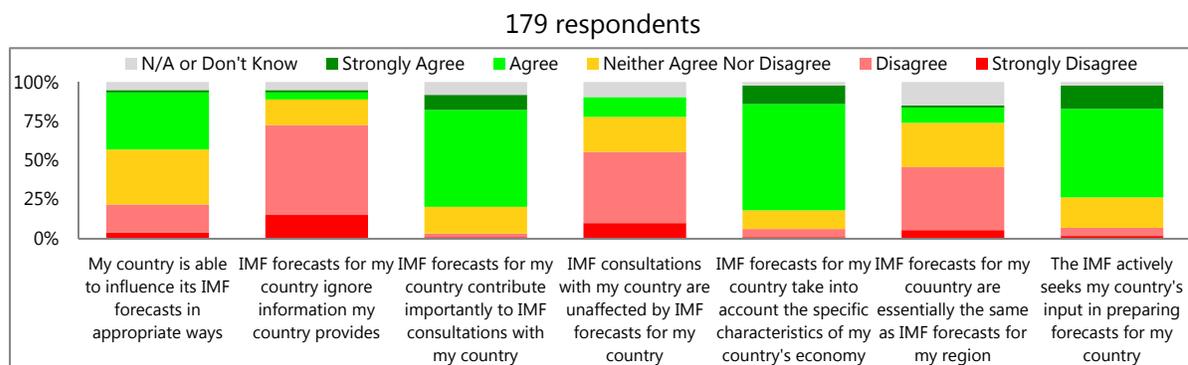
96. Country authorities in general believe they are properly consulted during the forecast process (Figure 12). Fewer than 10 percent agree that Article IV forecasts ignore information that their country provides, and fewer than 25 percent disagree that their country is able to influence IMF forecasts in appropriate ways.³⁰ Respondents from the Middle East and Central Asia are more likely to disagree with the statement than are respondents from other groupings.

97. A substantial majority of country authority respondents are satisfied with the consultation process with IMF staff during the forecast process (Figure 12). More than 80 percent of them agree or strongly agree that IMF forecasts contribute importantly to IMF consultations with their countries. About 85 percent of them agree or strongly agree that IMF forecasts take into account specific characteristics of their country's economy. And more than 75 percent agree or strongly agree that the IMF actively seeks their country's input in preparing forecasts for their country.

²⁹ Note that the sample of responses from the private sector is relatively small, a consequence in part of a low response rate in this survey. See Genberg and Martinez (2014a).

³⁰ However, 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.

Figure 12. Country authorities' views of the forecast-consultation process: Full sample—
Survey question: "Please rate your agreement with each of the following statements about the
construction and use of Article IV forecasts for your country."



Source: Authors' calculations based on IEO Forecast Evaluation Survey.

VI. CONCLUSIONS AND ISSUES FOR REFLECTION

A. The *WEO* Forecast Process

98. Has the IMF achieved the right balance between the top-down and bottom-up approaches and is the coordination mechanism optimal? In view of the challenges associated with producing mutually consistent forecasts for a large number of countries that differ from each other in important ways, it is clear that some combination of the two approaches is necessary. Whether the current balance is exactly right cannot be determined a priori, but the evidence on forecast accuracy reviewed in Genberg and Martinez (2014b) suggests that IMF's forecasts are of comparable quality to those of other institutions that produce multi-country forecasts. The same paper also reports evidence indicating that IMF forecasts incorporate global factors to a significant extent, suggesting that the top-down aspect of the process is taken into account in individual country forecasts. In other words, we have not found any evidence suggesting that an alternative to the current mix of top-down and bottom-up approaches used at the IMF would produce superior forecasts.

99. What about the coordination mechanism that brings the forecasts produced by each country desk into a coherent whole that is broadly consistent with the perspective given by the global projections model? Based on our interviews with staff we conclude that the recently introduced information-sharing arrangements described above have increased the efficiency of the overall forecast process relative to what it was as recently as five or six years ago.

B. Comparison with Other Organizations Producing Multi-Country Forecasts

100. The IMF forecast process is much larger in scope than that of the forecast processes of private forecasters, government forecasters, and most international organizations, and it takes more time than they do, but is also more comprehensive. No other agency provides forecasts for such a large number of countries of the world that are based on the same background assumptions and subject to a substantial set of checks and balances. The coordination mechanisms used by most other agencies and firms are less formal than those used by the IMF.

101. Interviews with private sector users of forecasts indicated that IMF forecasts are considered “stale” when they are released, especially relative to the more frequent forecasts produced by the private sector forecasters themselves. Nevertheless, private sector forecasters value the forecast-based analysis produced by the IMF and pay attention to IMF forecasts because the clients of private sector forecasts want explanations for any discrepancies between IMF forecasts and private sector forecasts.

C. The Nature of Bottom-Up Forecasts

102. IMF country desk economists use a variety of forecasting methods, and in all cases judgment is an essential component of the final forecast. Survey and interview evidence indicates that the methods used differ depending on data availability and a country’s level of development. This is clearly desirable. Likewise the evidence that judgment is an important element in the process is consistent with best practice.

103. Most country economists use the methodology that their predecessor employed. While many say that forecast accuracy is an important criterion for choice of a forecast method, most do not undertake regular analysis of their forecast errors. Country desk economists consult with member country authorities when they produce forecasts and country authorities are, by and large, satisfied with the amount of consultation that goes on.

104. Can methods and practices be improved? A number of staff indicated in interviews that a good forecast record was not appreciated sufficiently relative to, for example, writing a research paper. Interviews also revealed that the passing of the baton from one desk officer to another sometimes led to a loss of information about the economy both in terms of modeling work and in terms of “soft” knowledge that informs judgment.

105. The results of the IEO’s survey of country authorities suggest that country authorities have confidence in the integrity of IMF forecasts and, for the most part, believe that the process is free of inappropriate political influence. A majority of these authorities indicate that they believe that IMF forecasts are unbiased and provide an accurate picture of their economies. But some believe that politics is involved in the production of forecasts, that forecasts are biased, and that IMF forecasts do not treat every country fairly (Figure 9 in Chapter IV above). IMF Management and the Executive Board may want to consider

whether the frequency of such responses is sufficiently low to make further action unnecessary.

D. Issues for Reflection

106. In our assessment the *WEO* forecast process, and by extension the process that produces Article IV forecasts, compares favorably with that used in peer organizations and constitutes a clear improvement over previous practices. Nevertheless, based on our findings we believe that a number of issues deserve further reflection and continuous monitoring.

- (i) The IMF should prepare a description of the IMF forecast process intended for authorities in member countries and other users of these forecasts. The description should be posted publicly on the IMF website, reviewed annually, and revised as needed. Doing so would enhance transparency and thereby reduce the risk of misunderstanding of how the forecasts are arrived at. In preparing the description the IMF should provide a broad understanding of how the top-down and bottom-up components of the forecasts are gathered and combined, and how coordination is achieved within and across area departments. The IMF should also offer information about the assumptions and types of methods used to produce country forecasts. While the description should remain general and not country specific, it should provide enough information for readers to understand the IMF's approach to forecasting.
- (ii) The IMF should consider creating a more systematic process focusing on how country desk economists can learn from reviews of past forecast performance. That process should provide training for desk economists who require it.
- (iii) The IMF should extend guidance to desk economists about how best to incorporate advances in forecasting methodologies for economies at different stages of development, which have different structural features and different availability of data. This guidance should draw on analytical insights as well as on country experiences.
- (iv) Processes and incentives should be ameliorated to ensure that crucial country information is preserved when staff members move to new country assignments.
- (v) IMF Management should review the assessments by country authorities of the IMF forecast process and products and determine whether they imply a need for remedial action.

- (vi) A review should be conducted on a regular basis to determine whether the current country- and regional representation in the Global Projections Model is appropriate. As the world economy evolves, traditional country groupings may become obsolete.³¹
- (vii) Area departments should review whether the coordination and review process within the department is appropriately structured to ensure consistency between the individual country forecasts within the region and with the outlook for the region as a whole.

³¹ In December 2013, an IMF working paper describes that China has been added as a separate block in the GPM. See Blagrove and others (2013).

REFERENCES

- Blagrove, P., and others, 2013, Adding China to the Global Projection Model, *IMF Working Paper No. WP/13/256* (Washington: International Monetary Fund).
- Carabenciov, I., and others, 2013, “GPM6—The Global Projection Model with 6 Regions,” IMF Working Paper No. 13/87 (Washington: International Monetary Fund).
- Freedman, C., 2014, “An Evaluation of Commissioned Studies Assessing the Accuracy of IMF Forecasts,” IEO Background Paper No. BP/14/02 (Washington: Independent Evaluation Office of the IMF).
- Genberg, H., and A. Martinez, 2014a, “User Perspectives on IMF Forecasts: Survey Methodology and Results,” IEO Background Document No. BD/14/01 (Washington: Independent Evaluation Office of the IMF).
- , 2014b, “On the Accuracy and Efficiency of IMF Forecasts: A Survey and Some Extensions,” IEO Background Paper No. BP/14/04 (Washington: Independent Evaluation Office of the IMF).
- Luna, F., 2014, “IMF Training on Forecasting and Forecasting Method,” IEO Background Document No. BD/14/02 (Washington: Independent Evaluation Office of the International Monetary Fund).
- Timmermann, A., 2006, “An Evaluation of the *World Economic Outlook* Forecasts,” IMF Working Paper No. 06/59 (Washington: International Monetary Fund).

ANNEX. THE FORECAST PROCESS IN OTHER ORGANIZATIONS PRODUCING GLOBAL FORECASTS

The U.S. Federal Reserve Board

The U.S. Federal Reserve Board (FRB) generates forecasts for 25 foreign economies (7 advanced and 18 emerging) that together account for more than 90 percent of U.S. trade. For each, the FRB produces forecasts for the GDP growth rate, inflation, current account balance, policy rates, and the output gap. It does not routinely produce forecasts for GDP components. The FRB forecast process covers only 13 percent of the countries covered by the IMF.

Forecasting at the FRB uses fewer resources than forecasting at IMF. At the FRB, 15 economists produce forecasts and conduct forecast-based analysis: Euro Area (3), U.K. (1), Canada (1), Japan (2), China (1), and Emerging Economies (7). The FRB's Trade and Quantitative Studies section oversees the aggregation of individual country forecasts.

FRB forecasters are largely unconstrained in the construction of forecasts. The Trade and Quantitative Studies section provides them with oil price forecasts based on futures data, but not with model-based forecasts. They use a variety of forecast methods—some econometric and some not. But none uses a formal DSGE model. The FRB does not require that forecasts satisfy any adding-up constraints. It does aggregate current account balances and occasionally asks forecasters to reconsider when the aggregate current account balance seems out of line. The FRB takes the view that its forecast narrative is more important than the forecasts themselves. Overall, the FRB forecast process is more bottom-up than the IMF process.

Because it produces forecasts for far fewer countries, the FRB faces a less complicated forecast coordination problem than the IMF. The U.S. forecast section at the FRB provides the FRB's foreign-country forecasters with forecasts for the U.S. economy. The foreign desks then produce their forecasts and report them back to the U.S. section. The U.S. section then revises its forecasts and a new round begins. This iterative process typically converges quickly. The FRB forecast process does not include systematic analysis of forecast errors although such analysis is occasionally undertaken on an ad hoc basis.

The FRB forecast process occurs for each of the eight per year “Teal Book”¹ rounds and begins two weeks before each Teal Book deadline. The FRB considers *WEO* forecasts to be

¹ The “Teal Book” is the name given by the FED to the merger of the Green and Blue Books that occurred in 2010. The Green Book covered current economic and financial conditions and was distributed to FED officials several days before each FOMC meeting. The Blue Book was officially named “Monetary Policy Alternatives,” and provided policy alternatives for the FOMC to consider at its meeting. The “Teal Book” is officially titled the “Report to the FOMC on Economic Conditions and Monetary Policy” and is released to the public with a five-year lag.

too out-of-date when they become available to make useful contributions to its own forecast process. The FRB checks its forecasts against private sector, OECD, European Commission, and other central bank forecasts. FRB forecasters also occasionally consult with IMF country desk staff. They consider *WEO* analysis to be useful and influential and also use international data from the *WEO* database which they find more user-friendly than the OECD database.

The Organization for Economic Cooperation and Development

The Organization for Economic Cooperation and Development (OECD) produces forecasts for the 35 OECD countries and for the BRIICS group comprising Brazil, Russia, India, Indonesia, China, and South Africa. For each country, the OECD provides forecasts of many macroeconomic indicators including GDP growth, the unemployment rate, fiscal balance, the current account, investment and consumption growth, several measures of inflation, and growth in exports and imports.

The OECD forecast process entails four stages and 40 working days per forecast round. In the first stage, the Macro-Economic Policy Division (MPD) prepares for the forecast round by taking stock of recent developments, running an indicator model to generate forecasts for the G7 countries for the current and next quarters, forecasting trade and monetary variables, and having its sector experts prepare notes on economic developments. During this stage, the MPD develops its assumptions for the forecasting round and checks how changes in those assumptions will alter forecasts. Once these tasks are completed, the information that results is discussed in a general meeting. After the meeting, OECD directors issue strong guidelines for the forecasts that country desks are expected to follow.

In the second stage, country desks prepare the forecasts based on the guidelines from the directors. Desk economists use a variety of methods, including interactions with country authorities and the use of judgment, to produce their forecasts. After submission, topic experts and an interdepartmental group review the forecasts using a variety of criteria including trade consistency. The review sometimes leads to required changes in the forecasts.

In the third stage, the MPD presents the preliminary forecasts to the Short Term Economic Prospects meeting attended by delegates of the OECD countries. At this meeting, country representatives may argue for changes but OECD takes the position that the assumptions underlying the forecasts can be changed only for good economic reasons. Also during the third stage, the MPD compares its preliminary forecasts to forecasts produced by other forecasters, especially those investment banks that update their forecasts frequently. While it is not constrained by alternative forecasts, the MPD attempts to explain differences between forecasts and to decide whether a change in forecast assumptions is warranted by those differences.

In the fourth stage, MPD reissues its forecast assumptions and requires country desks to produce their final forecasts. If assumptions have changed, then country desks are expected to change their forecasts appropriately or explain why they do not.

Clearly, the OECD forecast process is smaller in scale than the IMF process and uses a more top-down approach than the IMF uses. The OECD publishes its forecasts in *Economic Outlook* (<http://www.oecd.org/economy/outlook/economicoutlook.htm#country>). It publishes only point forecasts and typically provides less information about forecast distributions than the IMF provides. Like the IMF, the OECD does not evaluate forecast errors on a systematic basis. It does issue a “post-mortem” analysis every five years.²

European Commission

The Directorate of Economic and Financial Affairs (DEFA) of the European Commission (EC) coordinates the production of EC forecasts. The EC produces forecasts for all EU member countries, EU candidate countries, China, Japan, Russia, and the United States. The EC groups remaining countries into large regions. While the EC aggregates to produce global forecasts, it places primary focus on the EU. There are three EC forecast rounds per year, in the Winter, Spring, and Fall. EC forecasts are reported in *European Economic Forecast*.³

The EC forecast process has both top-down and bottom-up elements. A coordination unit begins the process for each round by generating forecasts for the non-EU countries, setting assumptions about commodity prices, and passing this information to country desks. The coordination unit also provides a broader look at EU and Euro Area forecasts. As at the IMF, country desks themselves create the forecasts. Once country desks create their forecasts, they report them to the coordination unit which aggregates them and conducts consistency checks. For example, the forecast exports of a country *i* to country *j* are compared to the forecast imports of country *j* from country *i*. There are typically three rounds of interactions between the coordination unit and the country desks before the forecasts are finalized.

Neither the coordination unit nor the country desks uses formal DSGE models to produce its forecasts. Instead, forecasts are produced with a combination of judgment and empirical analysis based on reduced-form equations. The coordination unit uses a calibrated DSGE model called Quest⁴ to conduct risk assessments. Quest uses shocks to generate deviations from the baseline forecasts. Those deviations are presented in the form of a fan chart.

The forecast processes of the EC and the IMF treat differences between policy assumptions for program and non-program countries in a similar fashion. For non-program countries, the EC, like the IMF, assumes that policy changes will occur during the forecast period only if

² The most recent post-mortem forecast report is available at http://www.oecd-ilibrary.org/economics/long-term-growth-scenarios_5k4ddxpr2fmr-en.

³ A recent issue of European Economic Forecast is available at http://ec.europa.eu/economy_finance/publications/european_economy/2013/pdf/ee2_en.pdf.

⁴ For more information on Quest, see: http://ec.europa.eu/economy_finance/research/macroeconomic_models_en.htm.

they have been legislated in advance or if there is substantial knowledge that suggests they will occur. Otherwise, policy is assumed to remain constant during the forecast period. For program countries, it is assumed that all policy changes specified in the program will in fact be implemented. In the text that accompanies its forecasts, EC states its assumptions about policy changes explicitly, so that users understand the assumptions that underlie the forecasts for program countries. At the IMF, forecasts for program countries are likewise conditioned on the assumption that program terms will be fully implemented by the program country.

The EC conducts regular analysis of its forecast errors. The analysis uses standard statistical techniques and comparisons of EC forecasts to those of other forecasters.⁵ The most recent study concludes that EC forecast accuracy is good. However, it suggests that EC forecasts might be improved by incorporating more information from the financial sector and by revising the way they make assumptions about long-term financial market yields.

The EC is in the process of changing its data management software to the ECOS system, the same system used by IMF.

Asian Development Bank

The Asian Development Bank (ADB) produces forecasts twice a year and publishes them in the Asian Economic Outlook (AEO) which, like the WEO, includes thematic chapters. The AEO and the Bank's Chief Economist is ultimately responsible for the AEO's content. In order to limit member country influence on forecasts and analysis, the ADB Board does not have approval power over the AEO. But, as at the IMF, the AEO is presented to the Board before it is published.

The ADB forecast process has three stages. First, the MFRD provides country desks with baseline assumptions including forecasts of inflation, GDP growth, and policy interest rates for the U.S., the Euro Area, and Japan as well as forecasts of Brent crude oil prices (based on futures prices) and world trade volumes (obtained from the World Trade Organization). The Division generates its baseline forecasts using the IMF three-region version of the Global Projection Model and interacts frequently with the Fund's Economic Modeling Division concerning model-based forecasting issues.

Second, country desks produce forecasts for the AEO countries. Most desks base their forecasts on judgment but some use a financial programming framework similar to that used at IMF. For many of the Bank's member countries, lack of data prohibits the use of formal

⁵ A recent analysis of EC forecast errors is available at http://ec.europa.eu/economy_finance/publications/economic_paper/2012/pdf/ecp476_en.pdf.

models. The Economics and Research Department has provided some training for country desk economists on the use of the financial programming methodology.

Third, the MFRD collects individual country forecasts and conducts simple consistency checks. It also compares the forecasts with forecasts from other sources such as the IMF and Consensus Economics. The Division does not attempt to match ADB forecasts to those of other institutions, but does require country desks to have good explanations for forecast differences.

ADB does not routinely assess the accuracy of its forecasts. Five years ago, in response to complaints from client countries, ADB conducted an in-house comparison of its forecasts to those of other organizations and concluded that its forecasts performed well.

Citi Group

Citi generates monthly forecasts for all economies in which it conducts significant business—in practice these are a large fraction of the world’s economies. Country desk economists send forecasts for their countries to a central unit in London. The central unit checks the forecasts for consistency, mainly trade-flow consistency, and then aggregates them. Typically several iterations are needed to arrive at a consistent picture of bilateral trade flows and a reasonable forecast of global economic conditions. The mechanism for achieving convergence is a series of conference calls among forecasters. The conference calls add discipline to the forecast process because every participant has the opportunity to comment on everyone else’s forecasts and forecast analyses. The discipline checks a tendency for the forecasters to echo the views of local authorities in their countries.

Citi staff use IMF forecasts as benchmarks for their own although IMF forecasts are updated far less frequently than Citi forecasts. Citi also pays close attention to IMF forecasts because Citi clients routinely compare Citi and IMF forecasts and demand explanations for any differences. Citi also values the analyses published in *WEO* because they deal with issues that Citi believes are important for understanding global economic conditions. Citi also finds the *Fiscal Monitor* very useful.

J P Morgan

J P Morgan (JPM) produces forecasts for 34 economies in which it has particular business interests. It does not use IMF forecasts because these are available too infrequently. Nevertheless, JPM pays attention to IMF forecasts because its clients request explanations for any differences between JPM and IMF forecasts.

JPM finds the *WEO* data base useful and judges the fiscal analysis in *WEO* and the *Fiscal Monitor* extremely valuable. JPM reckons that it would be very difficult for anyone in the private sector to assemble the information that underlies the IMF’s fiscal analysis. JPM does not understand the IMF forecast process and wishes it were more transparent. JPM also

believes that the forecast process should give ownership of forecasts to each country team because doing so motivates country team members. JPM does not like the IMF's use of purchasing power parity (PPP) weights to aggregate country forecasts into a global forecast because it believes that PPP weights are inappropriate for thinking about global growth.

JPM produces a forecast every week. It uses a combination of top-down and bottom-up approaches. A three-member global team produces a "now" forecast for the global economy using a factor model that uses six indicators of global conditions as inputs. Each week country teams produce forecasts for their countries using a combination of judgment and econometric analysis but not structural models. And each week, JPM conducts a conference call during which country teams present their views on their economy and listen to the views of other country teams and the global team. When the aggregated forecasts of the country teams do not match JPM's global forecast, the conference call includes discussion of why this is so. While the conference call serves as a coordination mechanism, JPM makes no attempt to induce a mutually consistent set of forecasts. JPM tolerates inconsistencies so that team members rightly perceive that they have full ownership of their forecasts.

Goldman Sachs

Goldman Sachs (GS) judges IMF point forecasts to be not very useful because the IMF is "slow" and because IMF forecasts do not convey additional information beyond that available in GS or Consensus Economics forecasts. However, GS believes that the *Fiscal Monitor* contains useful comparative fiscal data that is hard to find in other places.

The forecast process at GS is highly decentralized. Regional groups are responsible for forecasts in their region. Forecasts for individual countries are largely based on judgment informed by estimation of a few reduced-form equations. GS does check to verify that trade flows add up appropriately but those checks rarely if ever lead to required revisions in forecasts. GS conducts conference calls whose primary purpose is to allow forecasters to question one another's views. The discussion process leads to a rough consensus about the global outlook.