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The External Policy of the Euro Area: Organizing for Foreign Exchange Intervention

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Abstract: Scholarship on European integration has extensively debated the external character of the monetary union. The institutions of exchange rate policymaking bear substantially on the euro area's role in international monetary conflict and cooperation. This working paper examines the institutional arrangements for foreign exchange intervention within the euro area and the policymaking surrounding the market operations of autumn 2000—the only case to date of euro area intervention in currency markets. Drawing on interviews of officials in finance ministries, central banks, European institutions, and international organizations, as well as public sources, the paper specifies the division of labor among the European Central Bank (ECB), Eurogroup, and other European actors and compares that arrangement with corresponding arrangements in the G-7 partners. It concludes, among other things, that (1) the interinstitutional understanding within the euro area gives substantial latitude to the ECB, greater latitude than held by central banks in its G-7 partners, (2) but the understanding is susceptible to renegotiation over time, and (3) economic divergence within the euro area potentially threatens the ability of the monetary union to act coherently externally.

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INTRODUCTION

During the first two years of the monetary union,[1] 1999 and 2000, the authorities of the euro area conducted extensive negotiations among themselves over the institutional arrangements for deciding on intervention, conducting such operations, and communicating them to the public. After a very large depreciation of the new currency, euro area authorities finally intervened in the foreign exchange market to support the euro in September and November 2000. This episode marks the first and only interventions after the formation of the monetary union and the only case to date of operations coordinated with the United States and other G-7 partners. The case is thus essential for understanding the external character of the monetary union and in particular the processes and institutions of external monetary policymaking. The present challenge of global current account adjustment gives the lessons of the autumn 2000 case contemporary policy relevance.

While the Maastricht Treaty established in principle a single exchange rate policy to correspond with the single monetary policy, it left considerable room for debate and bargaining over the institutional prerogatives of many European actors. The first question was the balance of authority between the finance ministers of the Eurogroup, on the one hand, and the Eurosystem, comprising the European Central Bank (ECB) and national central banks of the euro area, on the other. The second question was the balance of prerogatives between the center and the member states within both the finance ministry and central bank communities. The weakness of the euro during its first two years required that the euro area authorities confront these institutional questions and several practical problems in order to intervene in the foreign exchange market and communicate their intentions clearly.

This working paper reviews the institutional arrangements for exchange rate policy within the euro area and the decisions to intervene during autumn 2000. It examines the disunity among member governments at the outset of the monetary union, gradual convergence on intervention, and efforts of euro area policymakers to define the decision making roles of their institutions. The paper specifies their interinstitutional understanding; compares it with corresponding relationships between finance ministries and central banks in the United States, the United Kingdom, and Japan; and draws lessons from the checkered experience of G-7 coordination in September 2000. In addition to documents and press accounts in the public record, this analysis draws on more than 40 interviews conducted by the author with officials and former officials from finance ministries and central banks in Europe and the United States, as well as from European institutions and international organizations, during 2000–2005.

1. Broad treatments of the external policy of the euro area include Kenen (1995, 1998); Henning (1997; 2000b, 35–46); Bergsten (1997a); Masson, Krueger, and Turtelboom (1997); Eichengreen and Ghironi (1998); Bénassy-Quéré, Mojon, and Schor (1998); Deutsch (1999, 2000, 111–34); Everts (1999); Bismut and Jacquet (1999); Artus (2000); Henning and Padoan (2000); Frieden (2000, 203–14); Lorenzen and Thygesen (2000); Cœuré and Pisani-Ferry (2003); McNamara and Meunier (2002); Cohen (2003); Padoa-Schioppa (2004); and Posen (2005).

INSTITUTIONAL CHOICE: CLASH OF MODELS

Countries have located the balance of responsibility between their central banks and finance ministries differently. To varying degrees, the United States, Britain, and Japan vest leadership on intervention in their finance ministries, as did France before it adopted the euro. The rationales for this choice are several: Finance ministers are either elected or directly responsible to elected officials, are responsible for other policies that affect the exchange rate and that should be coordinated with it (such as fiscal and financial policies), and shoulder the fiscal consequences of capital gains and losses on foreign exchange reserves. Finance ministers also present and defend exchange rate policy to their legislatures. Other countries, however, notably including Germany prior to the monetary union, establish a balance that favors the central bank—on the rationale that exchange rate policy is the external dimension of monetary policy and the latter should not be distracted from domestic stability (Henning 1994, Destler and Henning 1989).

National legislation specifying the responsibilities of these bureaucracies focuses largely on their domestic tasks and often leaves their role in exchange rate policy vague. So, the authority to make decisions, conduct operations, and issue declarations about exchange rates is often instead established in patterns of practice and precedent and nonlegal understandings between central banks and finance ministries that are negotiated and renegotiated over time and largely opaque to outsiders.

With the formation of the monetary union, the responsibility for exchange rate policy passed along with monetary policy from member states to the euro area, and member states undertook the solemn obligation to adhere to the common policy.[2] The architects of the monetary union therefore faced the task of allocating powers on exchange rate policy among the European institutions. During the negotiations over the Maastricht Treaty and the preparations for the monetary union, however, member states disagreed over the assignment of these prerogatives.

The institutional landscape over which external monetary authority would be distributed differed greatly from that within the member states, which considerably complicated the assignment of responsibilities. Foremost among these institutions was of course the ECB, which along with the national central banks of the countries that adopted the euro will be called the "Eurosystem" in this working paper (figure 1). The finance ministers of the euro area countries comprise the Eurogroup, a subgroup of Ecofin, the configuration of the Council of the European Union that includes all the finance ministers in the Union. The central banks and finance ministries send deputies to the Economic and

2. Article 4 of the consolidated treaties provides for "the definition and conduct of a single monetary policy and exchange-rate policy the primary objective of both of which shall be to maintain price stability and, without prejudice to this objective, to support the general economic policies in the Community, in accordance with the principle of an open market economy with free competition."

Financial Committee (EFC), the successor to the Monetary Committee, the Euro Area Working Party of which gathers exclusively the officials within the monetary union. The European Commission serves as the guardian of the treaties and initiator of legislation in this area, as in others. Finally, the European Council, composed of the heads of government, completes the list of institutions with potential involvement in euro area exchange rate policy.

The legal framework established by the Maastricht Treaty addressed several specific questions. The objective of both monetary policy and exchange rate policy was "to maintain price stability and, without prejudice to this objective, to support the general economic policies in the Community."[3] Formal exchange rate agreements, which must respect internal price stability, are the province of the Council.[4] In the absence of a formal agreement, the Council can issue "general orientations" to the ECB with respect to exchange rates, although these too must respect domestic price stability.[5] The Council decides the external representation and arrangements for negotiating external monetary accords as well as the position adopted within such negotiations by a qualified majority.[6] Under each of these procedures, the Council acts on the initiative of the Commission, or on the initiative of the ECB in the case of formal agreements, and must consult the ECB.[7]

For its part, the Eurosystem was specifically empowered to hold and manage foreign exchange reserves and conduct foreign exchange operations. Although a substantial fraction of foreign reserves would not be pooled, the Eurosystem would ensure that those reserves remaining in the hands of national central banks did not interfere with exchange rate policy.[8]

However, the Maastricht Treaty left other important institutional questions unanswered. In particular, it left unclear precisely how the overall policy would be decided and implemented in the absence of formal currency agreements and general orientations—precisely those conditions that would apply during the early years of the monetary union. Would the Council or the ECB decide whether the exchange rate had moved too far? How would they come to that decision? Who would issue public

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3. See European Union: Consolidated Versions of the Treaty on European Union and of the Treaty Establishing the European Community (2002/C 325/01), *Official Journal of the European Communities*, 24.12.2002, Article 4, originally Article 3.

4. Article 111, paragraph 1; originally Article 109.

5. Article 111, paragraph 2.

6. Article 111, paragraphs 3 and 4. The Nice Treaty changed the decision rule for external representation from unanimity to qualified majority.

7. For analysis of these provisions, see Kenen (1995); Henning (1997, 2000a); Smits (1997); European Commission (1997); Hahn (2000); and Kutos (2001). See also Tommaso Padoa-Schioppa, The External Representation of the Euro Area, introductory statement at the Subcommittee on Monetary Affairs, European Parliament, Brussels, March 17, 1999.

8. Protocol on the Statute of the European System of Central Banks and the European Central Bank, Articles 3, 6, 23, and 30.

statements on the exchange rate and how would the content of those statements be determined? Would the Council or the ECB decide whether the ECB would conduct foreign exchange operations? What would be the balance of authority between the two institutions with respect to the timing, size, and rate of such operations? Would the ECB, national central banks, or both conduct these operations? How would coordination between the Council, Eurosystem, and Commission take place?

These ambiguities reflected continuing differences over the organization of exchange rate policy, which in turn stemmed from the more central conflict over the domestic price stability orientation of monetary policy and the independence of the ECB. Stability-oriented governments wanted to prevent the ECB, whose independence had been won through hard-fought bargaining, from being constrained by the Council through exchange rate policies. Others, having acceded to ECB independence and the principle of domestic price stability, resisted giving yet more ground to the ECB on exchange rate matters.[9] The debate became known in the European discourse as a contest between the "French model," which favored the Eurogroup, and the "German model," which favored the Eurosystem.

At the European Council meeting in Luxembourg in December 1997, the heads of government stated that the exchange rate should generally be viewed as the residual of other economic policies, that general orientations could be issued but in exceptional circumstances, which included a "clear misalignment," and that such orientations should always respect the independence of the Eurosystem and be consistent with the primary objective of price stability. Finance ministers in a subsequent Ecofin meeting affirmed that general orientations would be issued rarely. These agreements nevertheless failed to complete the institutional arrangements for exchange rate policy at the advent of the monetary union.

The treaty language, the Luxembourg Council meeting, and the difficulty of securing a consensus for action within the Council suggested that the euro area would more closely follow the German than the French model. But the prevalence of the Eurosystem was not by any means absolute: Those sympathetic to the French model had prevented the German model from clearly dominating the legal provisions and had kept the door open to exchange rate activism. At the launch of the monetary union, it is fair to say, the question of the relative dominance of the two models was still open.

US ECONOMIC GROWTH, EURO WEAKNESS

As the European Union created the euro, the United States was experiencing its most prosperous economy in more than a generation. Over the second half of the 1990s, the US economy expanded 18

9. On the genesis of the relevant sections of the Maastricht Treaty, see Kenen (1993, 1995), Henning (1994, 1997), and Kutos (2001).

percent in real terms, unemployment declined to just over 4 percent, yet inflation remained moderate. The stock market underwent a veritable bubble, inflated by the Internet and high-technology stocks, contributing to sustained increases in housing investment and a sustained decline in the private saving rate. Notwithstanding a shift in the US federal budget from large deficit to substantial surplus by 1999, therefore, the US current account deficit widened, registering $291 billion in 1999 and growing to $411 billion in 2000.[10]

The economy of the European Union was also buoyant, with growth averaging 2.5 percent during 1994–99, and inflation was moderate at 1.5 percent in 1999. Government budget deficits declined substantially as part of the convergence process, private saving remained substantial, and European stock markets rallied in the second half of the 1990s. Employment growth was less satisfactory, with the rate of unemployment remaining at 9.1 percent for the European Union as a whole and 9.9 percent for the euro area in 1999. The European Union and euro area ran small current account surpluses in that year.[11]

In the face of global financial volatility, the European Union orchestrated a smooth transition to monetary union at the beginning of January 1999—the culmination of at least a decade of preparation and an extraordinary achievement. Member states nonetheless confronted major challenges, including macroeconomic convergence of national economies, fiscal discipline, and structural reform, to consolidate the monetary union's success.

On the threshold of the creation of the monetary union, a large number of analysts anticipated an appreciation of the euro against the currencies of the area's main trading partners.[12] On January 4, 1999, the first trading day in Europe, the euro opened at $1.17, close to or somewhat below economists' estimates of its long-run equilibrium value.[13] Contrary to analysts' prior expectations, however, the euro began to depreciate almost immediately—the beginning of a long, steady, but relatively orderly decline through 1999 and the first three quarters of 2000.

As the euro sank, analysts would produce a series of explanations, each of which was based on one or more economic fundamentals. First, forecasts for US growth exceeded those for European

10. See US Council of Economic Advisers, 2004, *Economic Report of the President*, Washington: White House (February).

11. See *OECD Economic Outlook* no. 68, December 2000, and IMF's *World Economic Outlook,* October 2000.

12. See, for example, Bergsten (1997a); Alogoskoufis and Portes (1997); Rosecrance (2000, 47–56); Mundell (2000, 57–86); and Cooper (2000, 177–202).

13. Estimates of the equilibrium exchange rate generally fell in the range of $1.13 to $1.27 per euro. See Lorenzen and Thygesen (2001, especially table 1); Driver and Wren-Lewis (1998); Chinn (2000); Bergsten and Williamson (2004).

growth during 1999 and early 2000.[14] Second, owing to increases in labor productivity, which performed relatively poorly in Europe, estimates of the long-term growth potential for the United States were being revised upward as were estimates of returns to long-term capital investment. Third, interest rate differentials favored dollar assets and portfolio investment flowed toward the United States. Fourth, the pace of structural reforms that would increase the flexibility of the euro area economy was thought to be disappointing the markets (European Commission 2000; IMF's *World Economic Outlook*, October 2000, 15–16). But the euro's depreciation would reach a point that could not be explained by the economic fundamentals.[15] Another explanation, related to euro area institutions, became increasingly plausible: that the currency markets were reacting to the failure of the monetary union to project a coherent exchange rate policy or to demonstrate a capacity to intervene.

POLICY DISARRAY: AUTUMN 1998 TO AUTUMN 1999

Although member states executed the transition to monetary union smoothly in its internal aspects, the transition demonstrated the need for improvements in the machinery for external policymaking. Euro area officials clashed publicly over a proposal for target zones and desirable levels for the new currency, threatening to make a mockery of the commitment to pursue a common exchange rate policy. Let's consider those episodes and some of the causes of divergent exchange rate preferences.

German Target Zone Proposal

Even before the new currency was created, the unitary nature of the single exchange rate policy was challenged by the election of a new, SPD-Green government in Germany, led by Gerhard Schröder, chancellor, and Oskar Lafontaine, "super-minister" with a portfolio including the ministry of finance. At their joint press conference after their election, Schröder and Lafontaine announced their desire to institute target zones for the new European currency and the dollar, among others.[16] True to his word, Lafontaine raised the matter as chairman of the Finance G-7 in a meeting in Petersberg, Germany, in February 1999.

14. In October 1999, the IMF's *World Economic Outlook* forecast US growth of 3.7 percent compared with euro area growth of 2 percent in 1999 and US growth of 2.6 percent compared with euro area growth of 2.7 percent in 2000.

15. On the tendency of exchange rates to become unhinged from the fundamentals, see, among others, Williamson (1999).

16. Ralph Atkins, "Schröder Backs Plans for Currency Target Zones," *Financial Times*, September 29, 1998.

The views of other euro area member states on the target zone proposal varied. French Finance Minister Dominique Strauss-Kahn said the proposal was "a good one" but stressed the importance of advancing the goal of exchange rate stability in a practical way.[17] Others were quite skeptical. The Eurosystem in particular was unalterably opposed, having clearly specified that it would not target any particular exchange rate.[18]

In any case, the Schröder/Lafontaine announcement had not been coordinated with other euro area governments, and Lafontaine, while chair of the Eurogroup during the first half of 1999, did not have a Eurogroup mandate to propose target zones as a euro area position at the Finance G-7. This was not how the new euro area was supposed to work—one key member publicly declaring its commitment to a new policy and expecting the others and the ECB to follow. Nothing came of the proposal, which was effectively dropped when Lafontaine resigned unexpectedly in March 1999.

Declaratory Cacophony

The euro's depreciation occurred against many currencies, including the Japanese yen, pound sterling, and Canadian dollar. Most attention nonetheless focused on the new currency's rate against the leading international currency, the US dollar (figures 2 and 3). As in the case of member states' positions on the target zone proposal, European officials were similarly inconsistent in their public statements with respect to the exchange rate from the beginning of the monetary union through mid-1999, then more episodically thereafter.

During 1999, the German SPD-Green government made no secret of their contentment with the weakness of the euro. Finance Minister Hans Eichel urged EU leaders not to comment on the euro at the G-8 summit in Cologne in early June.[19] The Belgian finance minister, Jean-Jacques Viseur, said that he was against foreign exchange intervention or raising interest rates to support the currency.[20] Didier Reynders, his successor, said that the euro's value posed no threat to inflation, as it neared parity with the dollar in summer 1999, and was therefore not a matter of concern. French Finance Minister Strauss-Kahn offered encouraging comments with respect to the euro.[21]

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17. Robert Graham, "Mr. Euro-Zone," *Financial Times*, February 12, 1999.

18. See, for example, Committee on Economic and Monetary Affairs and Industrial Policy, European Parliament, Hearing with Dr. Willem F. Duisenberg, Brussels, January 18, 1999, 18–22.

19. Benedict Brogan, "Bid to Support the Ailing Euro," *The Herald*, June 3, 1999.

20. "Split Emerges over Euro Intervention," *The Independent*, June 1, 1999.

21. Douglas Hamilton, "Euro Close to Dollar Parity," *The Herald*, July 13, 1999.

Some officials in the central banking community spoke more forcefully about the dangers of euro weakness. Bundesbank President Hans Tietmeyer said that he would "not be happy" to see the euro fall below $1.04 and that "there should not be an attitude of neglect" toward the currency.[22] But after the currency rose slightly, his designated replacement, Ernst Welteke, said, "We don't want too strong an external value for the euro because it would weaken our export trade."[23] ECB President Willem (Wim) Duisenberg refused to stake out a strong position on the matter, saying only, "I am not going to express myself as being concerned or not concerned . . . I am inclined to play it down."[24]

The absence of discipline among European officials with respect to exchange rate statements, and the differences in the individual views, had become abundantly clear by mid-1999—the high-water mark for declaratory cacophony on exchange rate policy. Market participants seemed at times to be excessively open to being confused, giving credence and attention to statements by people who had no business in exchange rate policy or very little influence over it. But euro area officials did not help matters by their reluctance to address, once and for all, the logical institutional consequences of moving to a single exchange rate policy—namely, the consolidation of the group that would be "in the loop"—and to provide greater transparency with respect to the policymaking process.[25] Euro area officials simply had not worked out (a) who would talk about the rate and (b) how those authorized would coordinate their statements.

The cacophony itself became the focus of press attention in June 1999 and seemed to be contributing to euro depreciation.[26] German Finance Minister Hans Eichel, chairman of the Eurogroup, urged a "vow of silence" on exchange rates upon his fellow finance ministers in deference to the ECB president.[27] Chancellor Schröder tried to reinforce this effort during the Cologne G-8 summit in early June, and even reduce the number of statements of heads of government, but was forced to acknowledge that ". . . it hasn't been agreed. There are a lot of people involved, and I'm not sure they'll all do the right thing."[28]

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22. Alan Beattie and Christopher Swann, "Bundesbank Tries to Talk Up Sinking Euro," *Financial Times*, May 29, 1999.

23. Denis Staunton, "Low-Value Euro Is an Effective Remedy for the Economic Sick Man of Europe," *The Irish Times*, August 5, 1999.

24. Benedict Brogan, "Bid to Support the Ailing Euro," *The Herald*, June 3, 1999.

25. The IMF staff calls for greater transparency in the assignment of responsibility on exchange rates. See its report and the ECB response in IMF (2001).

26. Fratzscher (2004) finds "oral interventions" in general to be effective independent of actual intervention and monetary policy, although he does not specifically analyze the effects of statements of finance ministers within the euro area.

27. *The Irish Times*, June 5, 1999.

28. Ian Traynor, "Euro Summit Ends in Chaos," *The Guardian*, June 5, 1999; *The Irish Times*, "Men of Few Words

Dispersion of Preferences among Member States

Differences among the member states in terms of their exchange rate preferences can be understood largely through the differences in their economic circumstances. Differences in their (a) reliance on trade and (b) position in the business cycle were particularly important.[29]

Members of the euro area have different degrees of sensitivity to exchange rate movements of the euro. Trade with noneuro countries as a percentage of GDP is one measure of that exposure. As displayed in table 1, Ireland, Belgium and Luxembourg, Finland, and the Netherlands top the list. Germany is the most exposed of the large economies followed by France, Italy, and Spain. Note that France's exports to non–euro area countries were about three-quarters those of Germany as a percentage of national GDP during this episode, Italy's were smaller still, and Spain's were less than half those of Germany. The depreciation of the euro thus benefited the exports of the key members quite differently.[30]

Finance ministers evaluate the effects of euro depreciation on net exports in the context of their economy's overall macroeconomic performance. Countries growing above potential and experiencing substantial inflation might find a boost to net exports unwelcome; while those growing below potential and experiencing low inflation would welcome increases in net exports. We would therefore expect countries that were overheating to tend to oppose depreciation whereas countries with unused capacity would tend to favor depreciation.

Figure 4a locates the members of the euro area in space defined by the output gap and inflation. Countries located in the northeast quadrant would tend to oppose depreciation, which in these cases would widen the output gap, while those located in the southwest quadrant would tend to favor depreciation, which in these cases would narrow the output gap. Those in the northwest and southeast quadrants face a dilemma and could therefore be expected to be ambivalent. During mid-1999, the member states were scattered across the chart, with at least three countries falling in each of the

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on the Euro," June 5, 1999; Gary Duncan, "Euro Ministers Seek to End Currency Confusion," *The Scotsman*, June 4, 1999.

29. The literature on the political economy of exchange rate policy is extensive. Broz and Frieden 2001 provide one useful review. The author's contribution (Henning 1994) emphasizes the relationship between banks and industry and the independence of the central bank as key determinants of the broad pattern of exchange rate policy outcomes. While I expect this framework to be useful in analyzing the external policy of the euro area once the historical pattern can be discerned, it is less suited to the task of explaining a particular policy shift such as the one addressed by this working paper. The present exercise also differs from the exchange-rate policy literature in explaining the dispersion of preferences among countries within a monetary union rather than among monetarily sovereign states.

30. On member states' sensitivity to exchange rate shifts, see, for example, Padoan (2000). He finds that Germany is the most sensitive.

categories of depreciation-favoring, depreciation-opposing, and ambivalent. Nonetheless, those falling in the depreciation-favoring quadrant (Germany, Italy, Belgium, and France) commanded a substantial plurality, and the euro area as a whole falls in this quadrant.

The revealed preferences for exchange rate policy of the euro area members in mid-1999 coincide substantially with their location in figure 4a. Statements of government officials in Germany, Belgium, and Italy suggest approval of or complacency with the depreciation of the euro. As recovery proceeds in the euro area (discussed below), however, France is first among the countries with excess capacity to switch to opposition to depreciation and does so with a zeal that transcends its macroeconomic performance. While France's support for intervention can be explained in part by its lesser dependence on trade compared with Germany, its position suggests a significant role for institutional considerations in the determination of exchange rate policy.

ORGANIZING THE PROCESS AND INSTITUTIONAL FRAMEWORK

European officials were aware, some more keenly than others, that conflicting statements about the weakness of the euro breached the commitment to a common external policy and damaged the credibility of the monetary union. Better coordination of officials' signals to the markets was clearly necessary. The weakness of the euro also highlighted the need to specify the institutional procedures by which officials would decide and conduct foreign exchange interventions.[31]

During 1999, therefore, officials in the Eurosystem, Eurogroup, and finance ministries and central banks of euro area member states sought to clarify these arrangements. Their negotiations, which were sometimes easy, sometimes painstaking, took place within the formal bodies, such as in the EFC, as well as bilaterally, such as between the president of the Eurogroup and the president of the ECB. As chairman of the EFC and acting on behalf of the Eurogroup chairman, the director of the French Treasury, Jean Lemierre, played a leading role in defining these arrangements. Lemierre's counterparts at the ECB included Tommaso Padoa-Schioppa, member of the Executive Board, and Christian Noyer, vice president, both of whom acted on behalf of ECB President Wim Duisenberg and the Governing Council.

Early in the process, these officials decided that it would not likely be productive to negotiate over institutional prerogatives in a legalistic or abstract way and did not use Article 111 as primary

31. The following account of the institutional understanding, as other sections of this paper, benefit from several interviews with European officials and former officials conducted in Brussels, Frankfurt, Geneva, Paris, and Washington between October 2003 and September 2005.

guidance for their discussions. Both those officials preferring the French model and those preferring the German model agreed that the Article 111 text, while laying down some key parameters, provided little guidance on institutional prerogatives specifically on foreign exchange operations in the context of a flexible exchange rate regime. Moreover, they wished to avoid the deadlock that the legal focus of the Maastricht provisions helped to produce. Their discussions focused instead on the practical questions of who should speak publicly about the exchange rate, decide on intervention in principle, decide on intervention details, draft communiqués, and negotiate with international partners.

The fact that the euro area political authority is not a single minister but the Eurogroup complicated the assignment of responsibilities in three ways. First, the balance of authority between central banks and governments on exchange rate policy had differed at the national level; the Community could not create strong authority for the finance ministers collectively in the Eurogroup when that authority did not exist for some of the individual finance ministers at the national level. Second, the group as a whole must come to agreement and might require consensus when doing so. Consensus building takes time, whereas exchange markets can move rates quickly. Consensus and even a qualified majority might be altogether impossible to achieve. Third, the Eurogroup requires a chairman with a mandate to coordinate with the ECB and third-country monetary authorities. But, at that time, the chair of the Eurogroup rotated usually every six months, among small countries as well as large, and had no mandate to negotiate on external matters. Under those circumstances, it was impractical to vest in the Eurogroup the same decision making authority that had been vested in some of the finance ministers of member states, which naturally favored the Eurosystem.

The officials of the Eurogroup, the full Ecofin, and the Eurosystem reached an understanding on these questions—at least partially and tentatively—at an informal Ecofin meeting in Turku, Finland, in September 1999. This understanding was clarified at another Eurogroup meeting in early June 2000 in Luxembourg. Their consensus, the details of which were confidential, addressed decisions on market operations, consultation, and communication. The Eurosystem, meanwhile, addressed internally the trading mechanics by which foreign exchange intervention would be conducted.

Decisions

The understanding reached at Turku, and clarified subsequently, established three points. First, the Eurosystem would decide the timing, level, and amount of foreign exchange intervention. Partly by default, and partly by the attraction of the German model, therefore, the ECB was recognized as being "solely competent" for deciding on intervention. Finance ministers agreed that it would not be appropriate to attempt to force or instruct the Eurosystem to intervene. Second, however, intervention would take place under an understanding with the Eurogroup on action in principle arrived at in advance. Third, when conducting operations, the ECB would give notice to ministers.

Finance ministers and Eurosystem officials agreed that the Eurosystem does not need the Eurogroup's permission to intervene. But Eurosystem officials are also aware that it would make little sense to intervene against the express wishes of a significant number of finance ministers, because their public comments could undercut the effectiveness of the intervention. Central bank officials are also mindful that finance ministries generally have less tolerance for extreme currency fluctuations. Agreeing to intervene within informal agreements with the Eurogroup as a matter of practice (de facto) is not an exacting concession on the part of the Eurosystem.[32] Finance ministry officials, for their part, appear to have accepted the "sole competence" of the Eurosystem in matters of intervention as a practical necessity (de facto) rather than as a legal right enshrined in the Maastricht Treaty (de jure).

European officials also make a distinction between "strategic" interventions, whose objective is a significant change in the exchange rate, and "technical" interventions, aimed at more modest objectives. The three-point agreement described arrangements for strategic operations, those that involve other G-7 central banks and coordination with their finance ministries. Bargaining with the US Treasury, for example, requires the involvement of Eurogroup officials, principally the EFC chairman and the Eurogroup chairman. Technical interventions, by contrast, are smaller and perhaps more frequent and can be decided entirely by the Eurosystem.

External Contacts

Finance ministers of the G-7 partners, as elected officials or as appointees of elected officials who are in turn confirmed by national legislatures, prefer to deal with political officials within the euro area. Because the euro area has no direct counterpart to the US treasury secretary, the Eurogroup chairman serves as the closest analogue. The Eurogroup chairman attends the G-7 meetings at which exchange market conditions and intervention contingencies are discussed. But the Treasury was reluctant to rely exclusively on communication through a chairman who revolved frequently, among non-G-7 euro area ministers, and had little or no mandate from fellow ministers to negotiate accords.

A complex formula for US–euro area contacts was therefore necessary with respect to intervention. When agreeing to operations in principle, the US Treasury would communicate with the Eurogroup through the EFC chairman, who usually holds the position of deputy secretary or

32. The German Bundesbank, however, stresses the limits to the de jure role of the Eurogroup (Deutsche Bundesbank 2001, 30–31).

undersecretary in a national finance ministry. When arranging the specific details for such operations, Treasury officials would relate directly to officials in the ECB, the president of which is specifically entrusted with external contacts according to the understanding reached at Turku. This "cross-talk" broke a long-standing norm that central banks and finance ministries would deal mainly with their counterparts abroad. US Treasury officials at first insisted on checking back frequently with the EFC chairman but gradually became more accustomed to dealing with the ECB with less frequent checks. When agreeing on the press statement to be issued with operations, and after the Treasury and ECB were near agreement, the EFC chairman would be brought back into transatlantic conversation.

Two observations are worth mentioning. First, the placement of intervention authority substantially in the hands of finance ministries abroad and the preference of those ministries for dealing with politicos in the euro area were important bargaining chips of euro area finance ministries in their dealings with the Eurosystem. This was the hook on which they argued for involvement in the decisions regarding strategic, G-7 interventions. Second, these arrangements are complex and sometimes try the patience and, more importantly, the understanding of the G-7 partners. Changes in governments outside Europe and institutional evolution within Europe further increase potential confusion on the part of non-Europeans about how to relate to the euro area.

Communications

Because finance ministers will be asked about market operations and their comments will affect exchange markets, a coherent, coordinated message was recognized to be a necessary ingredient to success. The understanding reached at Turku specified the ECB president as responsible within the Eurosystem for communicating with the markets and that the members of the Eurogroup would use commonly agreed language on exchange rates and operations. Although the ECB might decide many of the essential details of operations, the press statement would be agreed between the central bank and the EFC chairman and the Eurogroup chairman as representatives of finance ministry officials.

Operations

The mechanics of foreign exchange trading was a matter addressed entirely within the Eurosystem. The main question was whether the foreign exchange trading desks of the national central banks would be maintained or whether a single trading desk would be established at the ECB in Frankfurt. To the dismay of many, the Eurosystem decided to both maintain the existing desks and establish a new one, for a total of 12 at that time. Although a subset of national central banks might be selected to conduct operations, all 12 could in principle participate. (By comparison, the Fed maintains only one trading desk, at the Federal Reserve Bank of New York, which acts as the agent for both the Federal Open Market Committee and the Treasury.) Aside from the inefficiency of this arrangement, the risk of leaks increases with the number of people with advanced notice of interventions. The resistance to consolidating trading desks is symptomatic of the broader unwillingness to centralize the Eurosystem.[33]

FORGING COHERENCE: WINTER AND SPRING 2000

While the preferences and postures of the euro area members on exchange rates were quite varied at the outset, the disadvantages of *further* depreciation nonetheless began to outweigh the advantages for an increasing number of them as the euro fell in late 1999 and the first half of 2000. The most reticent members within the Eurogroup and Eurosystem thus gradually shifted toward activism, permitting a gradual strengthening of joint statements during 2000.

Consensus Formation in the Eurogroup

By all accounts, French officials were the first and most consistent advocates of intervention to support the euro. In February 2000, for example, French President Jacques Chirac stressed the need for a strong euro.[34] Prime Minister Lionel Jospin called for concerted action in exchange markets in early May 2000.[35] Shortly thereafter, Finance Minister Laurent Fabius said, "For economic reasons, for psychological reasons and for political reasons we need a strong currency."[36]

At the end of January 2000, with the euro at $0.98, the Eurogroup issued its first substantial joint statement on exchange rates in the form of a "common understanding":

> The Euro 11 Ministers and the ECB share the view that growth is now very robust in the Euro area and is increasingly rooted in domestic demand. As a consequence, *the Euro has potential for appreciation*, firmly based on growth and internal price stability. A strong economy goes along with a strong currency. (italics added)

33. Padoa-Schioppa (2004); G. Thomas Sims, "Europe Central Banks Resist Integration," *Wall Street Journal*, May 3, 2005.

34. Robert Graham, Peter Norman, and Christopher Swann, "Euro Hit by Biggest Fall Since Its Launch," *Financial Times*, February 29, 2000.

35. Peter Norman and Christopher Swann, "Jospin Urges Action to Prop Up the Euro," *Financial Times*, May 5, 2000.

36. Mark Milner and Andrew Osborn, "Brown Talks Up Single Currency: Finance Ministers Stop Short of Intervention on Foreign Exchanges," *The Guardian*, May 9, 2000.

Finance ministers also reaffirmed their commitment to fiscal consolidation and structural reform.[37] But Italy's Treasury Minister, Guiliano Amato, denied that anyone in the meeting advocated intervention.[38]

When the euro breached the $0.90 level in spring 2000 (May 3), the ECB issued a supportive statement (discussed below). A few days later, the Eurogroup met and strengthened its language as well. The finance ministers said that, with the European commissioner and the ECB president, they shared the view that "growth is very robust in the euro area" and reaffirmed their commitment to fiscal consolidation and structural reform as laid out at the recent meeting of the European Council in Lisbon (Lisbon Agenda). The operative sentence read, "In this context, we share a common concern about *the present level of the euro which does not reflect the strong economic fundamentals* of the euro area."[39]

The statement, unanimously supported, did not threaten foreign exchange intervention, although the finance ministers had discussed market operations. But when he presented the communiqué to the press as Eurogroup chairman, the Portuguese finance minister, Joaquim Pina Moura, said, "The instrument exists and is available," a formula that was also used by other ministers in background press briefings.[40]

Coalescence of the Eurogroup around verbal support for the euro coincided with the gradual migration of member states from the southwest quadrant to the northeast quadrant of figure 4b. During the first half of 2000, all of the members except Germany were moving toward the depreciation-opposition quadrant, as was the euro area as a whole.[41]

Consensus Formation in the Eurosystem

Eurosystem officials were conscious, most of all, of their quasi-constitutional mandate to maintain price stability within the euro area. Even before the creation of the euro, they had disavowed any exchange rate target or target ranges, specified their commitment to a flexible exchange rate regime, in keeping with the

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37. Council of the European Union, press release, 2241st Council Meeting—ECOFIN, January 31, 2000 , Brussels, available at http://ue.eu.int.

38. Stephen Castle and Philip Thornton, "Fear of Higher US Interest Rates Prompts Record Fall in Euro," *The Independent*, February 29, 2000.

39. Council of the European Union, press release, 2258th Council Meeting—ECOFIN, May 8, 2000, Brussels, available at http://ue.eu.int.

40. Peter Norman and Christopher Swann, "Franco-German Differences Mar Euro Unity Meeting," *Financial Times*, May 9, 2000.

41. Befitting Germany's location in an ambivalent quadrant in figure 3b, the statements of German policymakers were inconsistent during 2000. Even in September, after the Eurogroup had come to a consensus on the need for action, for example, Chancellor Schroeder seemed complacent. Tony Barber and Christopher Swann, "Euro Dips to Low Point After Schroeder Comments," *Financial Times*, September 7, 2000.

Eurogroup's decision, and indicated that intervention would be exceptional.[42] ECB President Duisenberg was known to be profoundly skeptical of the value and effectiveness of foreign exchange intervention in particular.[43] Duisenberg's position on the matter accounted substantially, though by no means exclusively, for the reluctance of the ECB to intervene.

In its economic analysis, the Eurosystem filtered the depreciation of the euro largely through the lens of its impact on domestic prices. Within its Monetary Policy Framework, which it uses to set domestic monetary policy, the Eurosystem placed exchange rate factors in the "second pillar" of broader economic considerations, the "first pillar" being the growth of monetary aggregates.[44] By raising the price of traded goods, euro depreciation contributed to inflation, which might be acceptable when inflation was below the Eurosystem's target of "below two percent," as it was during 1999 (1.5 percent). During early 2000, though, the harmonized index of consumer prices, the ECB's standard measure of the euro area price level, was accelerating, making the increment to inflation from further depreciation decidedly unwelcome. (The inflation rate would in fact reach 2.8 percent for the year as a whole and rise to 3.0 percent for 2001.)

Several additional considerations reinforced the Eurosystem's concerns about depreciation fuelling inflation. Many citizens in the euro area had been promised a European currency that was "at least as strong as the D-mark." The large depreciation of the euro could be interpreted as inconsistent with that guarantee. The external value of the currency affected political attitudes toward the monetary union in member countries, and Denmark was scheduled to hold its referendum on joining the euro area in late September 2000. Moreover, the monetary union had yet to issue euro notes and coins, scheduled for 2002, a process that the Eurosystem did not want complicated by external volatility.

As a new central bank, however, the Eurosystem was also concerned to safeguard a reputation for effectiveness. Officials very much wanted their first intervention in the foreign exchange market to be successful, and to be successful they believed that such operations had to be consistent with domestic monetary policy. After having eased monetary policy at the outset of the monetary union, the Eurosystem began raising rates in November 1999 (figure 5). As the euro continued to weaken and inflation forecasts were increased, the ECB continued to increase rates in quarter-point increments in

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42. See, for example, Wolfgang Munchau, Peter Norman, and Lionel Barber, "Duisenberg Says ECB Would not Welcome Overvalued Euro," *Financial Times*, December 7, 1998, 3, 23; and "Builder of the Euro Team Spirit," *Eurecom Newsletter*, February 1999, 3.

43. See, among other examples, Committee on Economic and Monetary Affairs and Industrial Policy, European Parliament, Hearing with Dr. Willem F. Duisenberg, Brussels, January 18, 1999, 18–22; Duisenberg's speech to the Edmond Israel Foundation, Luxembourg, November 11, 1999, reprinted in *BIS Review* 125/1999.

44. A 2003 review reversed the designation of the two pillars. See ECB (2003).

early February, mid-March, and late April and by a half-point in early June. Because the Federal Reserve also raised interest rates, the increases by the ECB did not close the US–euro area differential.

Officials within the Eurosystem seemed to be as divided as ministers within the Eurogroup on the merits of intervention in 1999. The open differences between Bundesbank President Tietmeyer and Duisenberg with respect to the seriousness of the euro's depreciation (cited in footnotes 22 and 24 above) is one critical example. While Eurosystem officials could be expected to take a euro area–wide view of external monetary policy, coming from different national central banking traditions, they held different predispositions on external policy in general and intervention in particular. But the euro's depreciation forced them to revisit the questions over the first half of 2000.

Eurosystem officials discussed the causes and effects of euro depreciation and debated the merits of action to boost the currency in several institutional locations: the Executive Board, the Governing Council, and the International Relations Committee. The ECB's Executive Board consists of the president, vice president, and four regular members with eight-year, nonrenewable appointments.[45] Since all six members sit on the same two floors of the ECB building in Frankfurt, they can caucus on exchange rates among other issues virtually whenever the president wishes to convene them. Within the Executive Board, the president and the member responsible for European and international relations have the lead. The Governing Council consists of the six members of the Executive Board plus all the governors of the national central banks in the euro area. Importantly, the Governing Council is vested with the authority to make key exchange rate policy decisions such as intervention. The International Relations Committee consists of board members of the ECB and national central banks, who are sometimes represented by senior staff, and prepares substantive analysis for the Governing Council (Deutsche Bundesbank 2001).

The Finance G-7 met in Washington on April 16, on the margin of the spring meetings of the World Bank and IMF, with the exchange rate in the range of $0.95 to $0.96. Participants discussed the exchange rate and whether a strong statement signaling the possibility of joint action was desirable. When drafting the communiqué, though, Europeans were adamant about *not* singling out the euro as a currency that was misaligned. They wished to describe the exchange rate misalignment as a more general problem afflicting other currencies as well. Broad dollar indices showed that the US currency was not significantly higher than in January 1999, although perhaps 12 to 13 percent higher than in 1995. Treasury Secretary Lawrence H. Summers was therefore unwilling to state that the misalignment was general, involving the dollar and euro in roughly equal measure.

45. During the early years of the monetary union, these officials had terms of varying lengths, so that their successors' appointments would be staggered.

As a consequence, there was no agreement on strong language, and the communiqué simply repeated the previous formulation, "[W]e emphasized our view that exchange rates among major currencies should reflect economic fundamentals. We will continue to monitor developments in exchange markets and cooperate as appropriate."[46] The repetition of this formula after a 20 percent depreciation of the euro in 16 months reinforced the impression in the markets of the absence of official consensus on substance, statements, and action, and the euro continued its decline.

As the euro approached the $0.90 level, the ECB issued the following statement:[47]

> The Governing Council discussed recent movements in the exchange rates between the major currencies, including the recent decline of the euro, and examined their possible implications for price stability in the euro area. The ECB judges that thepresent level of the euro does not reflect the strong economic fundamentals of the euro area.

After the euro fell below the $0.90 mark in early May, the ECB issued another press release in the form of a statement by Wim Duisenberg intended to support the currency. The ECB president acknowledged the fear that euro weakness could increase inflation and "undermine the perception of the euro as a stable currency." He explained that the euro area had quite stable internal prices, that the ECB had increased interest rates recently in order to safeguard that stability, and that it would "continue to do all it can to maintain price stability in the euro area." With regard to the exchange rate, though, Duisenberg would commit only to monitoring it "very closely," not to intervening.[48]

Aside from the question of the management of the exchange rate, a number of analysts argued that intervention would have been desirable reserve management. By their calculations, the Eurosystem held excess reserves in very large quantities, variously estimated to be in the range of $100 billion to $200 billion.[49] The euro area would have been well served to invest these resources in other, higher-yielding European assets. The appreciation of the dollar offered a rare, perhaps unique, opportunity to liquidate the foreign exchange portion of these holdings at very favorable exchange rates. Similar arguments

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46. Statement of G-7 Finance Ministers and Central Bank Governors, April 16, 2000, available at www.g8.utoronto.ca.

47. European Central Bank, press release, Monetary Policy Decisions, April 27, 2000, Frankfurt, available at www.ecb.int.

48. European Central Bank, press release, Statement on the euro by Dr. Willem F. Duisenberg, May 5, 2000, Frankfurt, www.ecb.int.

49. See Henning (1997); Walter (2000); Wolfgang Munchau, "If the Euro's Exchange Rate Were a Share Price…," *Financial Times*, September 11, 2000, among others.

applied to the holdings of gold within the system.[50] The Eurosystem rejected this advice, however, in what appears to have been an expensive decision.

United States

Several press reports suggested that European officials believed that the US authorities were unwilling to intervene jointly, suggesting that this unwillingness was the cause of inaction.[51] Indeed, there were several plausible reasons why the US Treasury and Federal Reserve might not have been eager to intervene against the dollar. While the trade deficit was widening as a result of the strength of the dollar, that shift was taking some of the heat out of the extraordinary expansion of the US economy and helped to contain inflation. The growth of the current account deficit reduced GDP growth by almost 1 percent in 1999 and about 1.2 percent in 2000 to 4.5 and 3.7 percent in those years, respectively.

The trade deficit had not yet become a serious political issue, with employment low, and its continued financing not yet an object of concern. Although there was serious opposition in Congress to granting fast-track trade negotiating authority to the Clinton administration in order to launch what became the Doha Round, opposition was more a function of import penetration, outsourcing, and the relocation of factories abroad than the growth of the trade deficit per se.

Moreover, with stock prices far above the level at which Federal Reserve Chairman Alan Greenspan warned of "irrational exuberance" in December 1996, officials believed that the financial markets were substantially overvalued. The desired solution was a gradual unwinding, but many American policymakers feared a sharp bursting of the bubble. Conscious that foreign portfolio investment played an increasingly large role in the stock market, US officials were concerned that a reversal in the dollar/euro trend could aggravate a piercing of the bubble.

Nonetheless, during the spring of 2000, there were serious transatlantic discussions about intervention and the circumstances under which they might wish to launch operations. While in earnest, these conversations were also somewhat more exploratory than hard negotiations over a specific intervention agreement. European officials wanted to know in particular whether US authorities would be willing to join concerted operations.

Contrary to press reports at the time, the US Treasury was not dead-set against intervention to support the euro. As one of its stipulations, however, Treasury insisted that the joint press statement

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50. Gold reserves of the Eurosystem declined, but only marginally, under the first central bank gold agreement providing for limited sales during 1999–2004.

51. See, for example, Gerard Baker and Christopher Swann, "Is Europe Misinterpreting Signals from Washington?" *Financial Times*, May 10, 2000.

specifically state that the intervention was launched at the request of the Europeans. US officials were not persuaded by European arguments that the dollar/euro misalignment was an American as well as a euro area problem. Just as singling out the euro for special mention in the G-7 communiqué was unacceptable to European officials, however, satisfying the Treasury on this point proved to be unacceptable as well. The Eurosystem had not yet concluded that intervention was desirable, and European finance ministers were not willing to state that operations were launched at their behest.

G-7 INTERVENTION: SEPTEMBER 2000

By the beginning of September 2000, several factors caused European officials to favor intervention more strongly. Oil prices were increasing substantially and, with them, inflation forecasts as well. Euro area growth was expected to register 3.5 percent for the year, up from 2.4 percent in 1999. The ECB raised interest rates by one-quarter point at the end of August, a move that was not matched by the Federal Reserve, with no apparent effect on the trend for the euro, which stood at $0.89. The normally cautious IMF staff declared that the euro was "below the level that could be justified by medium-term fundamentals."[52] Finally, the chairmanship of the Eurogroup rotated from Portugal to France, whose finance ministry had been the most supportive of intervention.

The Eurogroup met at Versailles under the chairmanship of French Finance Minister Laurent Fabius on the evening of September 8, before the informal Ecofin meeting the next day. ECB Vice President Christian Noyer and European Commissioner for Economic and Financial Affairs Pedro Solbes were also present. The exchange rate and the merits of intervention were discussed at length.[53] A consensus thereby emerged among the Europeans in favor of action in the markets jointly with the United States and the rest of the G-7.[54] No formal decision was taken or "general orientations" issued, but the consensus provided a "green light" for the ECB, which now favored intervention as well, to initiate negotiations with the US Treasury and other authorities.[55]

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52. IMF's *World Economic Outlook*, October 2000, 13. Pre-publication copies were released in early September.

53. The Eurogroup statement reiterated its concern, shared by the ECB, that "the current level of the euro does not reflect the strong economic fundamentals of the Euro area." It added a line borrowed from the oft-repeated statements of the US Treasury, "A strong euro is in the interest of the Euro area" (Eurogroup communiqué, September 8, 2000).

54. Alan Beattie and Stephen Fidler, "Careful Planning Behind Banks' Euro Surprise," *Financial Times*, September 25, 2000.

55. Duisenberg later said that the timing of the intervention was governed in part by the approach of the US elections in November, closer to which the Europeans judged the Americans would be less likely to participate. Lea Paterson and Anatole Kaletsky, "Duisenberg and the Quest for Stability," *The Times* (London), October 16, 2000.

The Eurogroup consensus thus set in motion the specific negotiations with the United States that led to the intervention agreement. During the Versailles meeting, Fabius had telephoned Secretary Summers, who indicated his openness in principle to the operations. During follow up, as chairman of the EFC, Mario Draghi served as the principal liaison between the European finance ministries and the US Treasury, represented by Undersecretary for International Affairs Timothy Geithner and Assistant Secretary for International Affairs Edwin M. Truman.

Chairman Draghi spoke with Undersecretary Geithner on the margin of an OECD meeting in Paris on September 13 about intervening. The specific details of the intervention agreement—amounts, rates, timing, and press statement, among others– were hammered out directly between the US Treasury and the ECB. Geithner and the ECB's Tommaso Padoa-Schioppa spent hours on the telephone in what one inside observer described as "excruciating" negotiations. Draghi, representing the Eurogroup chairman and the EFC, was then brought back into the negotiations over the press statement.

While not advocating intervention, the US Treasury was sympathetic to the view that the euro's value did not reflect the economic fundamentals and was thus open to conducting joint operations. Treasury officials took pains to consult with top officials of the Federal Reserve, who shared their general reasoning and whose active support would be critical to any such operation. US officials nonetheless had two important conditions for participating in joint operations. First, as in the spring, the Americans wanted the joint statement that went to the press to say that the operation had been conducted at the request of the Europeans. Second, the European partners should understand that the Treasury would not abandon the "strong dollar" language that it had been using for several years to describe its stance on exchange rates and that they would reiterate this language when (inevitably) asked by members of the press about the intervention.

The Governing Council, which has the authority to decide on intervention for the Eurosystem, convened by telephone and approved the market operations on Thursday, September 21, paving the way for a formal request to the Treasury to launch joint operations.[56] ECB officials also communicated the Governing Council decision to EFC Chairman Draghi, who in turn notified Laurent Fabius. US and European officials also invited their Japanese, British, and Canadian counterparts to join in the intervention. Their agreement to do so brought in all of the members of the Finance G-7.

The annual meetings of the World Bank and IMF in Prague were scheduled for the weekend of September 23 and 24, when the Finance G-7 would also meet. During the run-up to those meetings, the IMF released its *World Economic Outlook*, which described the euro as "significantly misaligned" against the dollar and yen. When presenting the IMF forecasts to the press, Chief Economist Michael Mussa

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56. Alan Beattie and Stephen Fidler, "Careful Planning Behind Banks' Euro Surprise," *Financial Times*, September 25, 2000.

explicitly called for intervention to support the currency. "The market has gone a little bit nuts," he said. "Circumstances for intervention are relatively rare, but they do arise. . . . One has to ask, 'If not now, when?'"[57]

A multiplicity of European voices nonetheless created enough "noise" to cloak the preparations for the operations. Comments by Chancellor Schröder earlier in the month that the euro's weakness was "no cause for concern" but instead "more a reason for satisfaction" had reminded market participants of the differences of view among governments.[58] That impression was reinforced by Italian Prime Minister Guiliano Amato's observation, "The weak euro is making our enterprises very happy." The Bundesbank's Welteke was asked within hours of the Governing Council's approval of the operation whether intervention was imminent but coyly repeated the mantra that intervention remained in the arsenal but was used without advance notice.[59] Very shortly before the intervention, *The Independent* (September 20, 2000) wrote, "There is growing doubt that the finance ministers of the Group of Seven industrial powers, who meet in Prague this weekend, will sanction concerted intervention to stem the single currency's decline."

The G-7 acted on Friday, September 22, the day before its meetings in Prague. Launching the operations at 1:11 pm Frankfurt time, the authorities caught the large majority of market participants by surprise. The ECB, Federal Reserve, Bank of England, Bank of Canada, and Bank of Japan bought 4,595 million euros during the remainder of the trading day.[60] (See table 2; the size of the ECB's purchases was estimated but not confirmed.) The immediate effect on the exchange rate was dramatic, with the euro jumping from 87.5 US cents at the beginning of the operations to over 90 cents after the intervention, falling to 88.2 cents at the Friday close.[61]

The interventions were explained to the markets through several press statements and press conferences on September 22 and over the following weekend. The official statement, released by the ECB at the time of the intervention and repeated by other central banks, simply read:[62]

57. Quoted in Philip Thornton, "Fund Sparks Row over Euro Intervention," *The Independent*, September 20, 2000; and Diane Coyle, "Intervention Designed to Catch Markets Off Guard," *The Independent*, September 23, 2000.

58. Barber and Swann, "Euro Dips to Low Point after Schroeder Comments," *Financial Times*, September 7, 2000.

59. Tony Barber and Christopher Swann, "A Struggling Currency," *Financial Times*, September 21, 2000.

60. The Bank of England, Bank of Canada, and Bank of Japan operated as agents for their Treasuries; one-half of the Federal Reserve's purchases were for its Treasury; the ECB's purchases were entirely on its own account.

61. Fisher and Faulkner (2000); David Turner, "Euro Soars," *Financial Times*, September 23, 2000.

62. European Central Bank, press release, The ECB announces joint intervention in the exchange markets, September 22, 2000, Frankfurt, available at www.ecb.int.

> On the initiative of the European Central Bank, the monetary authorities of the United States and Japan joined with the European Central Bank in concerted intervention in exchange markets because of their shared concern about the potential implications of recent movements in the euro exchange rate for the world economy.

The Finance G-7 met in Prague the next day, Saturday September 23, on the margin of the Bank/Fund annual meetings. The G-7 communiqué said that the finance ministers and central bank governors discussed exchange market "developments," had a "shared interest" in a stable international monetary system, and noted that the United States, Japan, the United Kingdom, and Canada had joined the ECB in the previous day's intervention at the latter's instigation.[63]

Three aspects of the aftermath of the intervention had consequences for the institutional arrangements for intervention. First, G-7 solidarity proved to be short-lived, with conflicting public statements to the markets about the objectives of the exercise. Second, euro area officials jousted among themselves to define the precedent for their institutional roles. Third, the confidentiality of the euro area decision making machinery was brought into question. Consider each aspect in turn below.

The common front of the G-7 began to unravel almost immediately. During his opening remarks at the pre-Prague press briefing at 10:00 am (EDT) on Friday, Secretary Summers repeated the statement issued earlier by the ECB. Then he added two things: first, that the British and Canadian authorities also participated in the intervention; second, that the strong dollar policy remained intact. "Our policy on the dollar is unchanged. As I have said many times, a strong dollar is in the national interest of the United States." Summers refused to elaborate in response to questions by reporters about his specific concerns about the weakness of the euro, the reasons for the timing of the intervention, and how the intervention squared with the preference for a strong dollar. When asked whether the Europeans had agreed to any quid pro quo for the intervention, Summers mentioned "ongoing reforms in Europe" but did not characterize them as part of an agreement.[64]

Some European officials, such as Duisenberg,[65] asserted openly that Secretary Summers could have denied that US exchange rate policy had changed without showing such attachment to the "strong dollar" policy. Other European officials, such as Bundesbank President Ernst Welteke and the

63. The operative sentence read, "In light of recent developments, we will continue to monitor developments closely and to cooperate in exchange markets as appropriate" (Statement of the G-7 Finance Ministers and Central Bank Governors, Prague, September 23, 2000).

64. US Treasury Department, press conference with Secretary of the Treasury Larry Summers, September 22, 2000, Washington, available at www.useu.be.

65. Lea Paterson and Anatole Kaletsky, "Duisenberg and the Quest for Stability," *The Times* (London), October 16, 2000.

State Secretary in the German Finance Ministry Caio Koch-Weser were privately unhappy; but their confidential attitudes also made their way into the press.[66] The transatlantic exchange of comments in the press raised serious questions, if not outright confusion, in the minds of market participants about the depth of commitment and the basic objectives of the intervention.[67]

While European officials disputed American commitment to the intervention, Europeans also displayed internal differences with respect to institutional prerogatives on exchange rate policy. Aware that this intervention set precedents, the spokesmen for the political and central banking communities within the euro area took pains to "spin" the understanding of euro area institutional arrangements in their favor. French Finance Minister Fabius asserted the Eurogroup's role in organizing the operations. His statement, released on Friday, September 22 as well, read:

> As President of the Eurogroup, I have been informed by Wim Duisenberg, the President of the European Central Bank, of the interventions to be implemented today by the monetary authorities of the euro area, the United States and Japan. This operation follows the position expressed by the finance ministers of the euro area in Versailles on September 8 and shared by the European Central Bank and I fully approve it.

On behalf of the Eurosystem, Duisenberg was equally anxious to disabuse the public of any notion that the Eurogroup could dictate or block intervention. He stressed that the decision had been taken by the Governing Council:[68]

> We didn't ask for [finance ministers'] permission because we don't need permission. While ministers had a role in the overall orientation of exchange rate policy, the management of the foreign exchange markets was a matter for the ECB.

Moreover, the ECB also indicated that the intervention exercise had limits. "There is no strategy to continue and continue," said President Duisenberg after the G-7 meeting. "Intervention will take place when we deem it appropriate."[69]

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66. AFX News, "Welteke Feels Summers' Comments on Euro/Dollar Unhelpful—Breuer," September 25, 2000; Paterson and Kaletsky, "Duisenberg and the Quest for Stability." Press accounts later characterized senior Treasury and Fed officials as being perplexed and exasperated by the European reaction.

67. See, for example, Christopher Swann, "Euro Paralyzed by Intervention Fears," *Financial Times*, September 26, 2000.

68. Alan Beattie and Stephen Fidler, "Careful Planning Behind Banks' Euro Surprise," *Financial Times*, September 25, 2000.

69. Edmund L. Andrews, "Rescue Attempt for the Euro Falls Short of Bankers' Hopes," *The New York Times*, September 24, 2004.

The effort to spin the precedent continued during the following six weeks. On Friday, September 29, Draghi briefed the finance ministers in the Eurogroup on his role in the preparations for the intervention, and Fabius summarized the discussion in a document that was later circulated to participants. Duisenberg objected to Fabius's summary, however, fearing that an "innocent reader" might conclude that the finance ministers played a role in deciding intervention that is similar to the roles of the Treasury in the United States and the Ministry of Finance in Japan, which Duisenberg argued would be incorrect. After an exchange of letters between Duisenberg and Fabius, the Turku understanding was basically reaffirmed, and no further documents altering the institutional roles were negotiated.

Finally, the September 22 episode contained a serious problem: While the euro area authorities kept the planning for the operations generally confidential, it appears that leaks did occur. During the morning prior to the intervention, some currency traders purchased euros aggressively, raising its value a full 2 percent against the dollar before the central banks entered the market—a fact pointedly noted by the Federal Reserve Bank of New York in its subsequent quarterly report on foreign exchange operations (Fisher and Faulkner 2000, 816). The extended process of consultation within Europe and the involvement of the many national central bank trading desks in the operations created suspicion that the source of the leak was European. This incident underscored the need to streamline the consultation process prior to subsequent operations.

The exchange rate hovered around the $0.87 to $0.89 level during the following week. At the end of September, Denmark voted by referendum to reject adoption of the euro. In mid-October, Duisenberg again led markets to believe that follow-up intervention was unlikely.[70] These developments, uncertainty created by contradictory statements by G-7 officials, and the absence of further intervention seemed to contribute to downward movement of the euro, which reached an all time low of $0.827 on October 25 (figure 2).

On October 5, however, the ECB had raised interest rates another quarter point to 4.75 percent, a move that the Governing Council might well have anticipated when it approved the intervention two weeks earlier. Again, the Federal Reserve held its own rates steady (figure 5). ECB officials believed that the trends in monetary policy were consistent with intervention to support the euro. After the euro had strengthened over six trading days to near $0.86, they entered the market again, "leaning with the wind."

70. Duisenberg later admitted these comments were a mistake. Lea Paterson and Anatole Kaletsky, "Duisenberg and the Quest for Stability," *The Times* (London), October 16, 2000; and Lea Paterson, "Duisenberg Admits Mistake," *The Times* (London), November 24, 2000.

UNILATERAL INTERVENTION: NOVEMBER 2000

The Eurosystem intervened on Friday, November 3; Monday, November 6; and Thursday, November 9.[71] Close observers estimate the amounts purchased to have been around €1 billion, €1 billion, and €2.5 billion on these days, respectively, and thus comparable to the scale of ECB operations on September 22 (table 2). Although the rate dipped below $0.85 on a few trading days two weeks later, these operations broadly coincided with the low point for the currency.[72]

The November interventions contrasted with the September 22 operation in two ways. First, the November interventions were unilateral: The ECB did not ask, at least formally, the US Treasury or any of its other G-7 partners to intervene. US policymakers were distracted by the presidential elections of Tuesday, November 7, and afterward by the recounting of ballots in the state of Florida. They were not likely to have been receptive to a proposal for joint intervention in these circumstances. Euro area authorities might also have reconsidered the value of US participation, given Treasury's refusal to abandon the strong dollar rhetoric and the conflicting public statements this refusal generated after the September intervention.[73]

Second, the November operations also contrasted with that in September in that the ECB and its national central banks acted without prior consultation with finance ministers and their officials. Finance ministry officials were informed by their national central bank counterparts on the day of the operations. Eurogroup Chairman Fabius was reportedly informed of the intervention only about 10 minutes beforehand and objected that this notice was not sufficient. Duisenberg briefed finance ministers only on the evening of Monday, November 6, after the second day of unilateral operations.[74]

The absence of significant consultation prior to the November interventions generated significant resentment on the part of finance ministers. While they acknowledged that the Versailles Eurogroup meeting had given an informal "green light" to ECB action, they argued that the duration of

71. The ECB's statement confirming the operations specifically mentioned the effect of euro weakness on price stability as a motive (ECB press release, Frankfurt, November 3, 2000).

72. Exchange rate movements were thus consistent with the thesis that the September and November operations together broke the market trend. The euro rose to around $0.95 during December, fell back and stayed below this level during 2001 and into 2002, surging above parity in summer 2002. The efficacy of these particular operations is debated at greater length in Dominguez (2003, 217–45) and Truman (2004, 247–65).

73. Secretary Summers nonetheless offered verbal support: "We share the concern expressed by the European Central Bank in the context of its action today in the exchange markets about the implications of the broad movements in the euro for the world economy" (Hans Greimel, "Euro Slides Despite ECB Intervention," *AP Newswire*, November 3, 2000).

74. See, for example, Lea Paterson, "ECB's Top Adviser Resigns," *The Times* (London), November 8, 2000.

that approval did not extend indefinitely and that the ECB should have renewed its understanding with the Eurogroup before entering the market in November. Thus, although Fabius publicly supported the intervention on November 3, he and other ministers worked to change procedures for prior consultation.[75]

ECB officials argued that these were technical interventions in pursuit of the understanding with the Eurogroup of September and under the umbrella of the September G-7 agreement and joint operations. Executive Board Member Otmar Issing, for example, said the move should be seen as a continuation of the coordinated action of September 22.[76] Bank of England Governor Eddie George supported the ECB's interpretation by referencing the G-7 communiqué in brief remarks.[77]

This controversy was eventually resolved by a further refinement of procedures agreed between ECB officials and the chairmen of the Eurogroup and EFC. While reaffirming that the ECB retains the institutional prerogative to decide on intervention, even when it acts within a broad understanding with the Eurogroup, the ECB agreed to inform the president of the Eurogroup and the chairman of the EFC sufficiently well in advance to prepare a short statement to the press. It also agreed that the other finance ministers would be informed by their own central bank governors at the time of the intervention. Satisfied with this refinement, and his success in persuading the ECB to intervene in September, Fabius did not pursue further the question of the duration of the "green light."

ASSESSMENT AND CONCLUSIONS

This case yields several lessons and observations with respect to the (1) institutional prerogatives of the ECB relative to the Eurogroup, (2) potential fluidity of this institutional understanding, (3) suitability of these arrangements as a basis for G-7 cooperation, (4) complexity in interactions with G-7 partners, (5) external influence on the evolution of euro area arrangements, (6) basic dilemma in designing the decision making process, and (7) threat to coherence in the future.

First, it is clear that the "German model" has won the contest over the organization of foreign exchange intervention under flexible rates—at least for the time being. The Eurosystem decides the

75. The French Ministry of Finance issued the following statement later that day: "Laurent Fabius, as chairman of the Eurogroup, has been informed by the President of the European Central Bank, of the intervention achieved today on the exchange rate market to support the euro. Laurent Fabius has approved this intervention in line with the position expressed by the G-7 Ministers and Governors on 23 September, 2000" (press release, Paris, November 3, 2000).

76. Larry Elliott and Mark Milner, "Forex Markets Scorn ECB Foray," *The Guardian*, November 4, 2000.

77. Ed Crooks, "Bank Chief Says Investors Will Force Euro Recovery," *Financial Times*, November 3, 2000.

timing and amount of intervention as well as the rate at which foreign exchange is bought and sold. While the Eurosystem chose to operate under a political understanding with the Eurogroup in this case, ECB officials maintain the right to intervene without "permission" if need be. Virtually all responsible officials within the euro area accept that these are prerogatives of the ECB.

At the same time, the Eurosystem does not hold complete discretion over intervention de facto, even under a flexible exchange rate regime. Market operations would probably not be successful in the face of dissent among finance ministers. Central bankers wisely want some degree of consensus among political officials as a practical matter, therefore, and concede the need to act within a supportive political context, preferably a green light from the Eurogroup. Eurosystem officials also recognize the need to consult with finance ministers and draft press statements jointly through the chairmen of the Eurogroup and EFC. These understandings are embodied in the Turku agreement and its subsequent clarifications.

This arrangement gives considerably greater latitude to the ECB than institutional arrangements in the United States grant to the Federal Reserve. Both the Treasury and Federal Reserve own foreign exchange reserves and typically share intervention amounts equally. The Federal Reserve has independent legal authority to intervene, as the law has been interpreted, and has done so without the approval of the Treasury on some exceptional occasions. The Fed makes its own decision to participate in operations proposed by the Treasury. The Treasury consults extensively with Fed officials when formulating intervention plans, in part because operations are conducted by the trading desk of the Federal Reserve Bank of New York, and wisely takes cognizance of the Fed's monetary policy. Nevertheless, as the chief financial officer of the United States, the secretary of the Treasury has the lead on intervention decisions, usually determining the key parameters of operations, and can probably count on the support of the Congress in any open conflict with the Fed.[78] One key participant describes the relationship notionally as "60-40" in favor of the Treasury. The ECB has a great deal more leeway than do the central banks of the remaining G-7 countries, Canada, Japan, and Britain, which serve a pure agency role, buying and selling reserves that are owned almost exclusively by the finance ministry.

Second, the euro area authorities arrived at these arrangements largely as a practical modus vivendi and not a "final status" settlement of institutional prerogatives as a matter of legal principle. Finance ministers appear to accept the "sole competence" of the Eurosystem as a practical matter (de facto) rather than as a legal right (de jure), thus retaining the option of reclaiming some of this authority at some point in the future when they might be collectively capable of exercising it. If, on the other hand, ministers had accepted the dominant role of the ECB de jure, their scope to reclaim authority would be circumscribed. Although the formal treaties set some key parameters, they are broad and incomplete,

78. American arrangements are described in Destler and Henning (1989), among a number of other places.

leaving a good deal of "play" in practical institutional arrangements. With a strengthening of the role of the Eurogroup chairman under the two-year term, shift toward majority decision making, or enlargement of the monetary union, for example, officials on the political side might assert themselves more strongly.

To some extent, this "permanent potential renegotiation" of institutional arrangements is characteristic of the euro area's international partners as well. However, institutional conflict and uncertainty carries greater risks for the euro area—a collection of nation states—than for the United States, Japan, and the United Kingdom. There is generally less concern among market participants about the ability of finance ministries and central banks to come to internal agreement and negotiate their differences in these countries. In other words, the confidence hurdle is higher for the euro area. Moreover, these countries have broader political systems that can effectively adjudicate conflicts between their finance ministries and central banks, a role played by the US Congress on a couple of important occasions during the 1970s, for example.[79] The European Union might not be able to adjudicate such interinstitutional conflicts effectively.[80]

Third, one might fairly ask: Is the euro area up to the present challenge of global adjustment? Whether Europe can contribute to that process through structural reform and growth is a broader question than addressed by this case. But the case does address questions about the euro area's preparations for a prospective intervention and negotiations with its partners over intervention agreements. The autumn 2000 episode showed that the euro area was capable of mounting such operations and doing so with reasonable effectiveness. On the other hand, the transatlantic coordination of the intervention was not wholly satisfactory to either side, as demonstrated by conflicting statements that probably weakened the effect of the September action.

Several European officials report that tension between the Eurogroup and EFC on the one hand and the ECB on the other eased noticeably in the years following 2000. The Eurogroup and its chairmen were content to delegate a substantial amount of the preparation of exchange rate matters to the EFC chairman when Caio Koch-Weser served in that position. Meanwhile, as ECB president, Jean-Claude Trichet has handled exchange rate issues more subtly and effectively than his predecessor. More recent G-7 meetings and exchange rate statements suggest that the working relationship among these officials has been effective. However, that relationship has not been tested by another intervention episode, and personnel changes in the future might not be as conducive to smooth cooperation as those in the past have been.

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79. See, among others, Destler and Henning (1989, 89).

80. The absence of a strong political union as a context for the monetary union has been emphasized by, among others, Verdun (1998), Berman and McNamara (1999), Dyson (2000), Caporaso (2000), and Jones (2002).

Fourth, one complication with operating under a modus vivendi that is largely opaque to the public is that even the euro area's partners sometimes have difficulty knowing how to engage with it. Several of the G-7 partners are not accustomed, for example, to the distinction made within the euro area between institutional procedures for deciding on an intervention, on the one hand, and drafting the language of the joint statement and issuing it to the press, on the other hand. Clarity in who should talk to whom across the Atlantic is further complicated by the dependence of these lines of communication on personal relationships among officials and the changes in personnel over time.

Fifth, Europe's partners have significant influence over the evolution of the euro area's institutional arrangements for external policies. Euro area finance ministries relied on the leadership of other finance ministries in the G-7 on exchange rate policy when arguing for their own involvement in decisions related to strategic/G-7 interventions. The US Treasury also influenced the representation of the euro area within Finance G-7 meetings.[81] The US treasury secretary's (and other finance ministers') preference for dealing with elected officials or those responsible to them—notwithstanding the Summers team's willingness to talk directly to the ECB and work through the chairman of the EFC—could be a force for reconsideration of European arrangements over time. Informal meetings of the G-3 (US, Japanese, and euro area officials), which have been held more recently, similarly affect the balance of prerogatives among the institutions of the euro area.

Sixth, euro area institutional arrangements confront a dilemma between minimizing the risk of leaks prior to operations and maximizing the coherence of officials' public statements. To minimize the risk of leaks and front-running in the foreign exchange market, arrangements would confine prior knowledge to the minimum number of people. To maximize officials' coherence, coordinate the press statement, and spread a full understanding of the terms of the intervention agreement (such as the Treasury's caveat about its "strong dollar" mantra in autumn 2000), arrangements would include all of the finance ministers in pre-operation consultations. This dilemma is solvable but requires that national finance ministries and central banks cede authority and privilege to the presidents of the Eurogroup and ECB, respectively.

Finally, the current divergence of economic performance in the euro area has ramifications for the ability of the monetary union to act coherently not only internally but also externally. This case demonstrates how the differences in economic performance among member states contributed to the differences in preferences on exchange rate policy among finance ministers during 1999 and 2000. With divergence, should it persist or widen, ministers could well have a more difficult time achieving consensus within the Eurogroup on desirable limits to exchange rate fluctuation. To the extent that the ECB

81. This point is described briefly in Padoa-Schioppa (2000) and Henning (2000a).

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Table 1 Euro-12 countries: Extra– and intra–euro area trade, by country
(ranking by extra–euro area export share in 2000; in percent of GDP at market prices)

	1996				2000				2003			
	Exports		Imports		Exports		Imports		Exports		Imports	
Country	**Extra**	**Intra**	**Extra**	**Intra**	**Extra**	**Intra**	**Extra**	**Intra**	**Extra**	**Intra**	**Extra**	**Intra**
Ireland	38.1	26.6	38.3	9.5	50.2	30.4	42.6	10.9	35.5	24.9	27.2	7.9
Belgium/Luxembourg[a]	23.1	37.6	20.3	35.4	29.0	49.6	31.1	44.1	29.1	51.2	28.0	45.5
Finland	21.1	9.0	15.0	7.9	25.1	13.1	18.9	9.7	22.1	10.7	16.4	9.9
Netherlands	15.1	27.9	20.7	18.4	22.2	39.8	35.6	22.6	21.0	36.6	30.0	21.8
Germany	12.0	9.5	10.4	8.3	16.3	13.0	15.7	11.0	17.5	10.1	14.6	10.2
Austria	10.3	14.7	10.0	19.1	15.9	19.6	13.5	24.4	17.4	20.9	14.4	25.0
Euro-12	**11.5**	**12.1**	**10.8**	**11.1**	**15.2**	**15.6**	**14.7**	**14.6**	**14.5**	**15.2**	**12.8**	**14.2**
France	9.2	9.3	8.7	9.0	12.5	12.2	11.5	13.8	10.9	11.1	9.5	13.2
Italy	10.8	9.6	8.1	8.7	11.8	10.2	11.2	10.7	11.1	8.9	9.9	10.4
Spain	6.5	10.2	8.9	11.1	7.9	11.3	11.5	14.3	7.3	10.8	10.4	14.5
Portugal	7.4	13.9	10.1	20.4	7.5	14.4	12.1	23.8	7.1	14.1	9.2	22.7
Greece[b]	5.1	4.5	10.3	12.8	6.4	3.4	12.6	12.7	4.9	2.2	13.5	12.5
Memorandum item:												
United Kingdom	11.0	10.7	12.8	11.0	9.2	10.5	12.5	10.8	8.4	8.6	11.2	10.1

a. Belgium's trade with Luxembourg is included in 2000 and 2003 data.
b. Greec entered the Economic and Monetary Union in 2001.

Note: Trade in goods only; exports f.o.b.; imports c.i.f.

Sources: IMF's *Direction of Trade Statistics*; World Bank's *World Development Indicators*.

Table 2 Foreign exchange intervention to support the euro, September and November 2000

Date	Institution	Amount bought	Amount sold
September 22	Bank of Japan	1.5 billion euros	143.5 billion yen
	Federal Reserve	1.5 billion euros	1.34 billion US dollars
	Bank of England	85 million euros	51 million pounds
	European Central Bank	2.5 billion euros[a]	Not specified
	Bank of Canada	110 million euros	97 million US dollars
November 3	European Central Bank	1 billion euros[a]	Not specified
November 6	European Central Bank	1 billion euros[a]	Not specified
November 9	European Central Bank	2.5 billion euros[a]	Not specified

a. Observers' estimates in newspaper accounts, including the *Financial Times*, *Daily Telegraph*, *The Guardian*, and *The Independent*.

Sources: Japan's Ministry of Finance, Foreign Exchange Intervention Operations Statistics, www.mof.go.jp; US Treasury and Federal Reserve Foreign Exchange Operations Report, Federal Reserve Bulletin (December 2000); UK Treasury, Exchange Equalization Account: Report and Accounts 2000–01, www.hm-treasury.gov.uk; Canada's Department of Finance, Exchange Fund Account Annual Report 2000, www.fin.gc.ca.

Figure 1 Institutions for external policy of the euro area

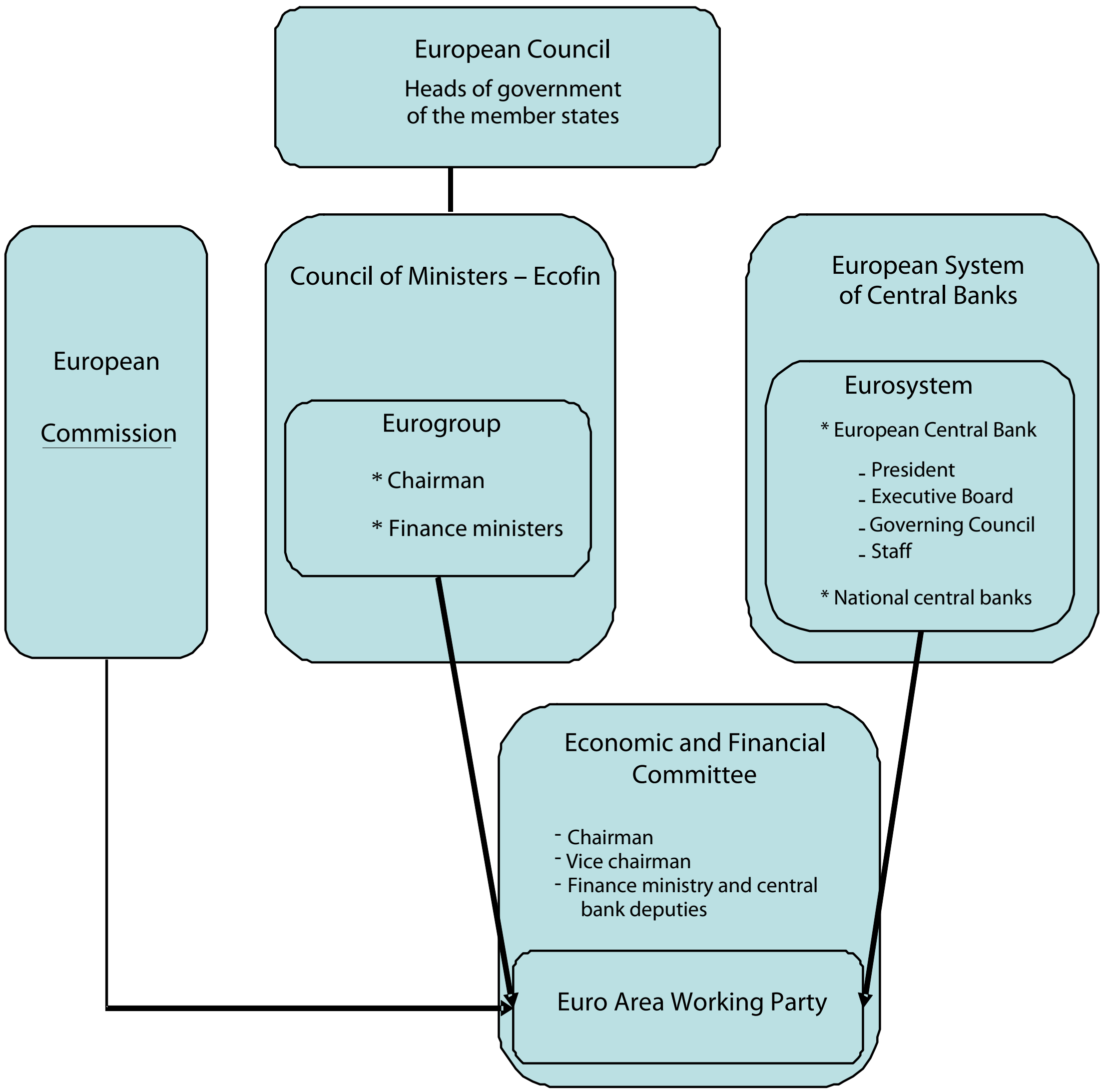
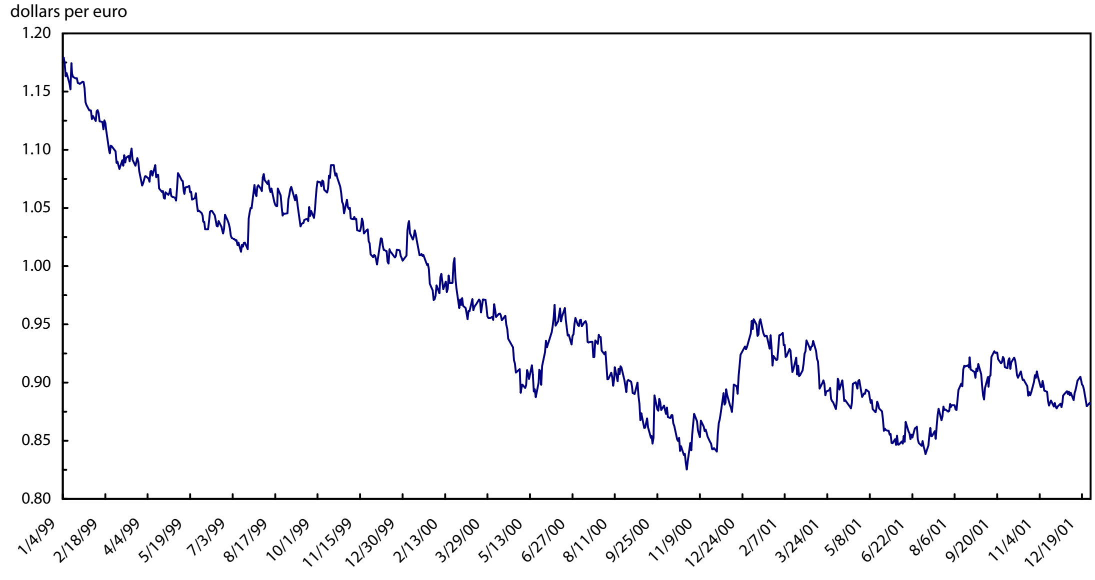


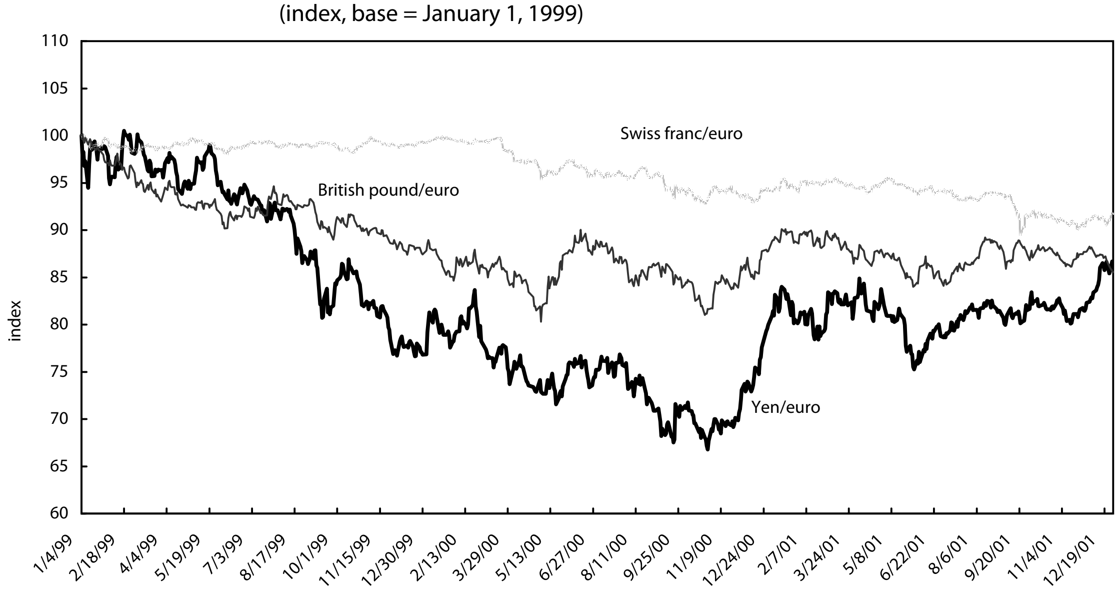
Figure 2 Daily euro–US dollar exchange rate, 1999–2001



Note: Initial observation: January 4, 1999; final observation: December 28, 2001.

Source: European Central Bank.

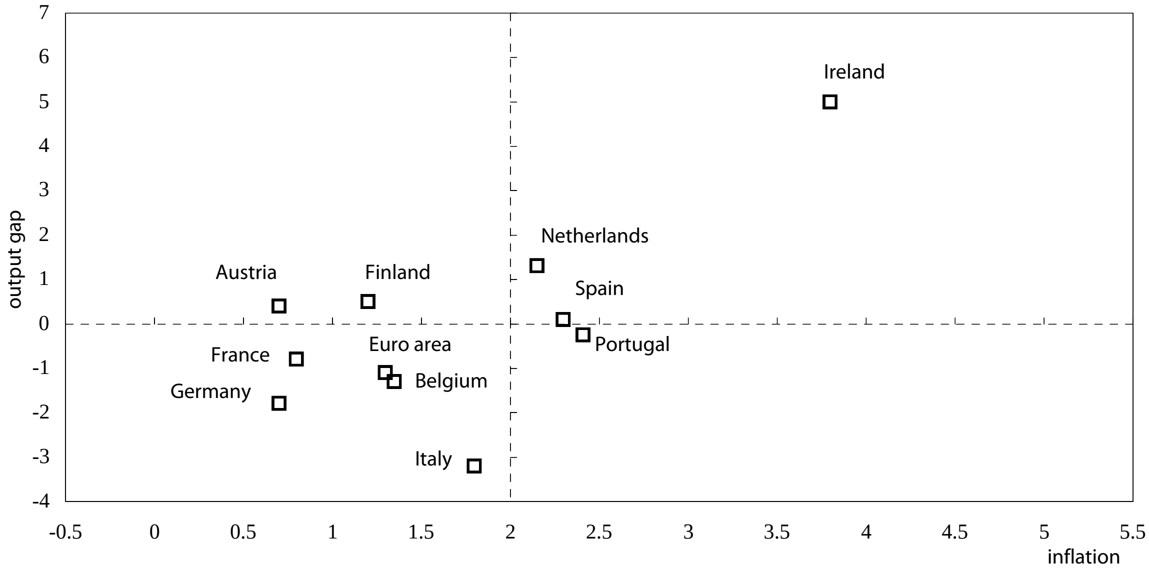
Figure 3 Daily euro exchange rates, 1999–2001
(index, base = January 1, 1999)



Note: Initial observation: January 4, 1999; final observation: December 28, 2001.

Source: European Central Bank.

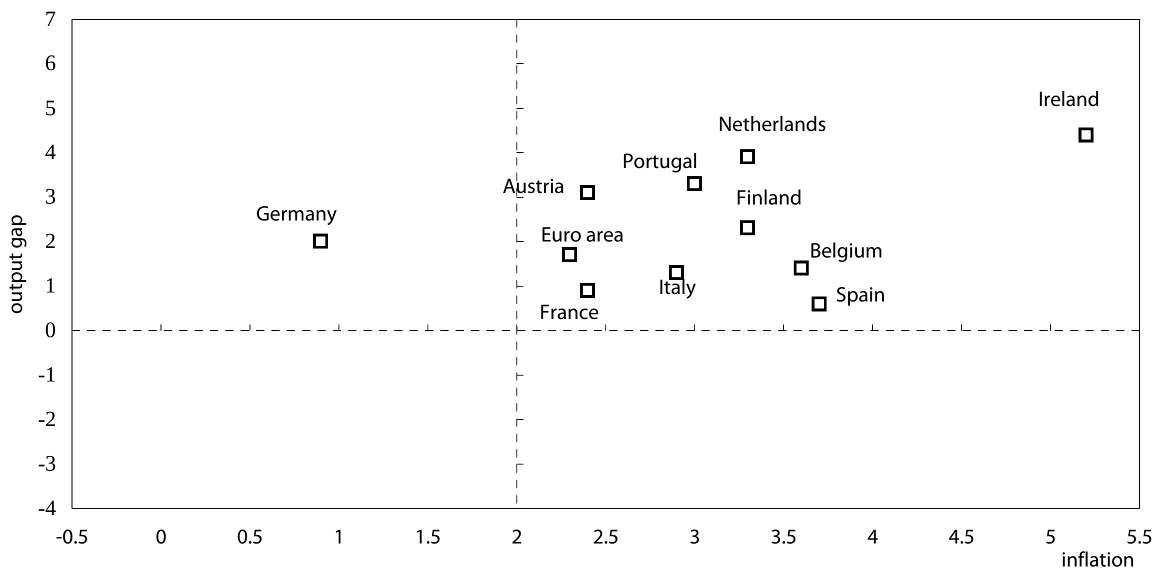
Figure 4a Inflation and output gap, mid-1999 (percent)



Note: Output gap in percent of potential GDP and private consumption deflator inflation.

Source: OECD, *EMU One Year On,* volume 2000, no. 2.

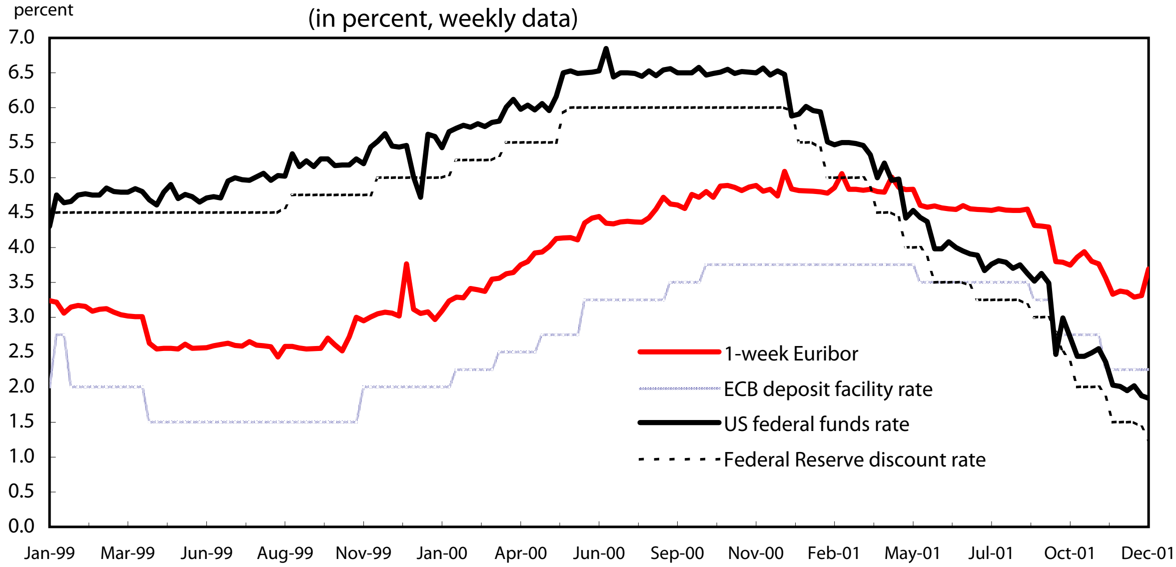
Figure 4b Inflation and output gap, 2000 (percent)



Note: Output gap in percent of potential GDP and private consumption deflator inflation.

Source: OECD Economic Outlook, volume 2005/2, no. 78, December.

Figure 5 US and euro area interest rates, 1999–2001
(in percent, weekly data)



Sources: European Central Bank, Euribor Web site, www.euribor.org; Federal Reserve Board.