

DOES A LESS ACTIVE CENTRAL BANK LEAD TO GREATER ECONOMIC STABILITY? EVIDENCE FROM THE EUROPEAN MONETARY UNION

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On January 1, 1999, 11 European countries gave up the independence of their monetary policy by joining the European Monetary Union (EMU). Since that time, these countries have shared a common currency, the euro, and, more important, are all now under the direction of a common European Central Bank (ECB) that controls monetary policy for the entire euro area. In accordance with Article 105(1) of the Maastricht Treaty, the primary objective of the ECB is to maintain price stability. The institutional designs of the ECB as well as their stated primary objective lead most economists to believe that the new ECB is a relatively inactive central bank in the pursuit of short-run macroeconomic stabilization. Thus most, if not all, of the countries in the EMU are now under a central bank that is much less active than was their previous national central bank. In this article, we examine whether this shift in the activism of the monetary regime has resulted in more or less macroeconomic stability for these countries.

Even before the official starting date for the EMU, a substantial academic literature speculated on how the move toward a common central bank would affect the macroeconomic stability of these countries. This literature has generally concluded that the movement toward a common central bank would make these economies more unstable because of the inability of a common central bank to tailor monetary policy to the needs of each country. As each country experiences country-specific shocks, the ECB will not be able to counter

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these shocks as well as a system of autonomous central banks. Thus, this previous academic literature has concluded on theoretical grounds that the EMU-member countries will suffer wider swings in real economic activity after the move to a common central bank.¹

A monetarist critique of this position, however, has yet to appear in the literature. The monetarists have long argued that monetary policy is the main source of economic instability, even when the policy is well-intentioned. Brunner (1985:12) states the monetarist position concisely: “Discretionary management ultimately fails to deliver, even with the best intentions, on its promise.” The monetarists believe that problems with lags and proper timing result in policy errors that induce less, rather than more, economic stability. If this position is correct, it suggests that having a common central bank that is unable to “optimally” respond to individual country-specific shocks could actually result in greater economic stability in the EMU member countries, not less. In other words, a common policy that is less responsive to country-specific shocks will result in greater stability because there will be fewer macroeconomic swings induced by monetary policy errors. However, for some countries that used to have a very inactive national central bank (such as Germany’s Bundesbank), the new ECB might actually be more active than the old national central bank. In this case, the monetarist position would argue that these economies would become more unstable after moving under a more active ECB.

Three decades ago, a substantial academic debate raged about the relative effectiveness of fiscal and monetary policy at providing economic stabilization. Now, a consensus appears to have emerged that fiscal policy is generally less effective than monetary policy to promote short-run economic stability.² In this modern view, fiscal policy should primarily be concerned with promoting long-run economic growth through maintaining reasonably low marginal tax rates, constraining deficit finance, and removing regulations and taxes that interfere with domestic or international economic transactions. Monetary policy, on the other hand, is now accepted as the primary method with which countries can conduct economic stabilization. The main debate that remains is whether well-intentioned monetary activism is *actually* effective at promoting stability, a debate that is more

¹For a discussion on the possible effects of a common central bank, refer to Feldstein (1997, 2000), De Grauwe (2000), Salvatore (2002), and Martin-Das (2002).

²Rasche and Thornton (2001) present arguments on the ineffectiveness of fiscal policy in achieving short-run stability.

important today than ever before with fiscal policy no longer being considered an effective stabilization tool.

The formation of the EMU provides a unique opportunity to see how a change in the activism of monetary policy affects the economic stability of a country. The evidence from this European monetary transformation will clearly help to resolve the substantial disagreement among economists on the issue of whether monetary activism provides more or less macroeconomic stability. If well-intentioned activist monetary policy cannot promote economic stability, it would suggest that the main focus of central banks should be on long-run price stability, rather than on short-run macroeconomic stabilization.

This article proceeds by first reviewing some of the previous literature on the EMU and presenting a monetarist critique of this literature. We then proceed to measure how active each country's national central bank was before the formation of the EMU and compare this with how active the new ECB has been since it was created. Finally, we examine which countries have seen the greatest increases (or decreases) in economic stability since joining the EMU, and attempt to find a correlation between the change in the activism of monetary policy and the change in economic stability.

The EMU: Origins and Previous Literature

The Maastricht Treaty signed on February 7, 1992, by the 15 members of the European Union called for the creation of a new ECB by January 1, 1999. The ECB would be assigned the task of conducting the single monetary policy for the 11 EMU members.³ The statute of the ECB (Protocol, Article 2) states that the primary and overriding goal of the European monetary authority is to “maintain price stability.”⁴ Following almost perfectly the monetarist view, constant growth rate rules for the money supply have a prominent role in the statute of the ECB (the euro area M3 money supply has a 4.5 percent growth rate reference value, for example). Undeniably, the ECB is based on a more monetarist framework similar to that of the old German Bundesbank, where the weight that monetary policy

³Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Spain and Portugal satisfied the economic criteria imposed by the Maastricht Treaty and formed the EMU on January 1, 1999. Greece met the criteria to join the EMU on January 1, 2001. The United Kingdom, Denmark, and Sweden opted out of the EMU because of their concern about the loss of national sovereignty.

⁴The statute defined price stability as maintaining the yearly increase in the Harmonized Index of Consumer Price to be less than 2 percent for the euro area.

puts on long-run price stability significantly exceeds the weight put on maintaining short-run economic stability.

In his address to the Federal Reserve Bank of Kansas City in 1999, the president of the ECB, Wim Duisenberg, reemphasized the commitment to price stability of the ECB. Duisenberg (1999) stated that monetary policy should never be reoriented away from its primary objective of maintaining price stability. He continued by emphasizing that low and predictable inflation is necessary for maintaining sustainable output growth and high levels of employment. Duisenberg made it clear that the ECB believes that even moderately high rates of inflation are harmful to economic growth.⁵ Furthermore, the fact that the ECB is following this more nonactivist framework can be found by looking at its actions in 2001 when the global risk of a recession was apparent. That year, while the U.S. Fed cut interest rates 11 times and the Bank of England cut interest rates 7 times, the ECB cut interest rates only 4 times despite worldwide pressures to do more.

Even before the ECB formally came into existence in 1999, an academic literature began to emerge speculating on how the move toward a common central bank would affect the economic stability of the European member countries. The consensus that emerged from this literature contained little hope that there would be an increase in economic stability. Eichengreen (1992), Bayoumi and Eichengreen (1993, 1997), for example, pointed out that the members were not forming an optimum currency area as was defined by Mundell (1961). An optimum currency area consists of a group of countries that share similar economic shocks and between which labor and capital can flow freely. Because of the dissimilarity of the shocks historically experienced by the EMU member nations, there are likely to be situations in the future where the optimal monetary policy will differ across these countries. A common central bank, however, will be unable to tailor monetary policy to suit the needs of each nation simultaneously. Because the new ECB will be unable to optimally respond to these asymmetric (country-specific) shocks, the economies of these nations will become less stable as a result.

Similarly, De Grauwe (2000) shows that for asymmetric shocks the ECB would stabilize too little from the point of view of what would be optimal for the individual member states because it will be reacting to an average across all countries. Stevens (1999) claims that the

⁵This argument is shared by Barro (1996) who found a negative relation between inflation and economic performance in 100 countries from 1960–90.

inability of the ECB to respond to individual country needs could eventually lead to members withdrawing from the EMU. Likewise, Salvatore (2002) claims that when a country is hit by an asymmetric shock, the country will ultimately have to wait for the economy to self-correct. Salvatore believes that the self-correcting process may be lengthy, and no government could politically afford to tolerate such a drawn-out process. Salvatore provides evidence that Italy and Spain are the EMU members that will most often face asymmetric shocks, and, therefore, will face the highest cost of the shared monetary policy.

A Monetarist Critique of the Previous Literature

The previous literature on the likely effects of moving toward a common ECB is rooted in a fundamentally activist theoretical framework. However, substantial disagreement exists among macroeconomists about the validity of this position. In particular, monetarists believe that there are problems in monetary policy implementation that may significantly reduce the potential for active monetary policy to stabilize an economy, even if the policy is well-intentioned.

The monetarist view can be summarized by a belief that lags in the implementation of monetary policy create a situation in which it is generally impossible to properly time monetary stimulus and contraction. Thus, the use of activist stabilization policy will frequently result in errors that result in wider business cycle swings than would be present if the central bank simply did not respond to economic shocks. The main conclusion of the literature in this area, typified by Friedman (1961, 1968), Brainard (1967), Phelps (1968), Brunner (1985), Meltzer (1987) and Orphanides (1998, 2000, 2002), is that monetary policy should primarily be concerned with long-run price stability, rather than short-run stabilization and that the economy will be more stable as a result.⁶

The monetarist view would suggest a much different picture about the likely effects of moving to a common central bank than has been painted by the previous literature. If, as the monetarists believe, well-intentioned monetary activism actually results in less economic

⁶Ellison and Valla (2000) show that strategic interactions between central banks and private agents create additional motivation for less activism in monetary policy. In particular, activism by central banks will lead to more fluctuations in inflation expectation by private agents, which may eventually translate into more volatile output and less social welfare. Furthermore, this theory implies that a central bank, which takes into account the fact that its actions affect learning, should choose to be less active than a central bank that ignores learning effects.

stability, then the inability of a common central bank to respond to all of these asymmetric shocks will actually result in greater economic stability, not less. In addition, the countries that will find the largest increases in economic stability from joining the EMU are precisely the ones that used to have the most active national central banks. On the other hand, for some countries that used to have very inactive national central banks, such as Germany, it is possible that the new ECB is actually more active than the old national central bank. If this is true, it is possible that they will see less economic stability after moving under a more active central bank.

Thus, there are two competing theories that produce totally different predictions for how the economic stability of each country will change after the formation of the EMU. The activist model that has served as the foundation for the previous literature predicts that a common central bank that is less active with respect to asymmetric shocks will result in less economic stability in these countries, while the monetarist model predicts just the opposite. The monetarist model predicts that the lack of response to these shocks should result in greater economic stability. Thus, by examining how the economic stability of these countries has changed since the move to a common central bank, and whether this change is related to the activism of the old national central bank, it is possible to test the predictions of these competing schools of thought.

How Active Were the Old Central Banks?

In this section, data are presented on how active the central banks of Austria, Belgium, France, Germany, Italy, and Spain were before the formation of the EMU.⁷ Measuring the activism of monetary policy is not an easy task, however, and there exists no consensus on how to empirically measure the size and direction of changes in monetary policy. Sims (1972), and Grier (1984, 1989) identify changes in monetary policy by measuring changes in the stock of money, defined as M1.⁸ More recently, alternatives to M1 have also been used. For example, Sims (1992), Bernanke, and Blinder (1992), Bernanke, and Mihov (1995), and Caporale and Grier (1998) use changes in the U.S. federal funds rate as their measure of monetary policy changes.

The debate over measures of monetary policy has centered on the choice of monetary aggregates versus interest rates. While monetary

⁷This is the set of countries for which consistent and reliable data were available.

⁸Hafer and Kutan (2002) showed that money, measured by M1 or M2, provides a good measure of the monetary policy stance.

aggregates are endogenous and not under direct control of central banks, monetary aggregates are highly correlated with movements in inflation.⁹ Therefore, movements in monetary aggregates reflect the policy actions of the central banks. Table 1 presents several measures of monetary activism for each country based on M2, as well as real and nominal short-term money market interest rates.

The first two columns of Table 1 report data on the volatility of M2 money growth for the period 1987:01 to 1998:12.¹⁰ The larger the number, the more active the central bank was during the period. The absolute value in the first of the two columns computes each country's M2 volatility relative to the mean of its own series using the variance formula

$$(1) \text{ Absolute Variance } (\Delta M2) = \sum_{t=1}^T \frac{(\Delta M2_{N,t} - \mu \Delta M2_N)^2}{T}$$

where M2 is the log of the money supply, $\Delta M2$ is money supply growth, $\mu \Delta M2$ is the mean of $\Delta M2$, N is a particular EMU member country (or the ECB), and T is the number of monthly observations. The relative value presented in the second column computes each country's M2 volatility relative to the same-period value for the United States, rather than to the mean of the own series using

$$(2) \text{ Relative Variance } (\Delta M2) = \sum_{t=1}^T \frac{(\Delta M2_{N,t} - \Delta M2_{US,t})^2}{T}$$

where US refers to the contemporaneous value for the United States.

We compute this second measure, variance relative to the United States, as a way to check the robustness of our results. Because the old national central banks and the new ECB operated in different time periods that may be structurally different, adjusting the data relative to the United States helps to make sure that any such difference is not driving our results. In other words, economic conditions in the post-ECB era may have been significantly different from the economic conditions in the pre-ECB era, and normalizing the variance around the United States can help to adjust for this, particularly because the Fed retained the same chairman during the period we consider. While we mainly discuss the absolute measures, we provide these

⁹For a discussion of the relationship between money and prices, see Hafer and Wheelock (2001) and Meltzer (2001).

¹⁰The monthly data on M2 are taken from the Banque De France statistical office, and the choice for the starting date is dependent on the availability of the data, as well as the fact that it coincides with the debut of Alan Greenspan's chairmanship at the Fed, which is useful in later measures of the old central banks' activism relative to the Fed. We wish to thank Dr. Virginie Coudert from the Banque de France for providing us with the data.

TABLE 1
MEASURES OF CENTRAL BANK ACTIVISM

Country	Standard Deviation of M2 Growth Rate in Percent		Variance of Nominal Short-Term Interest Rate		Variance of Real Short-Term Interest Rate		Weight on Output Gap Relative to Expected Inflation (γ/β)
	Absolute Value	Relative Value	Absolute Value	Relative Value	Absolute Value	Relative Value	
	<i>Prior to Formation of EMU (before January 1999)</i>						
Germany	0.54 (0.62)	0.55 (0.61)	4.3 (5.1)	10.3 (9.5)	1.0 (2.6)	3.6 (6.5)	0.03
Austria	0.48	0.48	5.4	8.5	2.6	6.1	0.09
Belgium	0.48	0.58	5.1	9.1	3.1	9.3	0.14
Spain	0.61	0.61	14.8	37.7	7.3	23.3	0.25
France	0.85	0.75	6.8	10.2	4.1	13.8	0.35
Italy	1.17	1.10	7.0	28.0	2.7	16.1	0.45
U.S.	0.23		3.3		1.9		0.15
	<i>After Formation of EMU (since January 1999)</i>						
ECB	0.33	0.34	0.8	3.5	0.1	1.1	
U.S.	0.33		1.6		1.0		

NOTES: One of the largest shocks to hit Germany in the early 1990s was the reunification of Western and Eastern Germany. The monetary response of the Bundesbank during the reunification period was extraordinary. We believe it distorts quite a bit the real measure for the Bundesbank's monetary policy especially in our measure of variance and standard deviation where outliers drive the results. The results in this table show both the data excluding the year of the German reunification and the data with the full sample in parentheses.

measures relative to the United States simply to show the readers that our results are robust to an adjustment of this type.

The results in Table 1 show that the volatility of M2 growth was the greatest for Italy, France, and Spain and the lowest for Austria, Belgium, and Germany. This implies that the old national central banks of Italy, France, and Spain were relatively more active than the national central banks in Austria, Belgium, and Germany. To check the robustness of these conclusions on the activism of the national central banks obtained from information on M2 volatility, we performed the same calculations (in absolute and relative terms) using monthly data on both nominal and real short-term market interest rates (r) as

$$(3) \quad \text{Absolute Variance } (r) = \sum_{t=1}^T \frac{(r_{N,t} - \mu r_{N,t})^2}{T}$$

and

$$(4) \quad \text{Relative Variance } (r) = \sum_{t=1}^T \frac{(r_{N,t} - r_{US,t})^2}{T}$$

where the value subscripted US refers to the U.S. federal funds rate.

The second and third pairs of columns in Table 1 show the results using interest rates as a measure of monetary activism. These measures lead to virtually the same conclusion as the monetary aggregate measures. Specifically, the results for both nominal and real interest rates reemphasize that the old national central banks of Spain, France, and Italy were more active than those of Austria, Germany, and Belgium. Moreover, the volatility of an EMU member country's nominal and real interest rates relative to the mean of its own series and also relative to the real and nominal federal funds rate in the United States gives virtually the same results.

The results presented in Table 1 are based on what might be considered simple measures of monetary activism. They are simple in that they incorporate information on all changes in these variables, not just those changes that were made by the central bank in response to short-run economic fluctuations. This has the potential to be troublesome because activism is traditionally defined as the degree to which central bank policy responds to short-run fluctuations in real economic activity. Thus, a good measure of monetary activism would only include changes in monetary policy associated with changes in short-run economic conditions. In an attempt to obtain more precise measures of monetary activism, we estimated a forward-looking Taylor rule model for each country to estimate the old national central banks' response to real economic conditions following the approach

taken by Faust, Rogers, and Wright (2001). This type of policy reaction function assumes that the central banks have a targeted nominal interest rate, r_t^* , that depends on the expected output gap, $E_t(y_t)$, and expected inflation, $E_t(\pi_{t+n})$ following the equation:

$$(5) \quad r_t^* = \alpha + \beta E_t(\pi_{t+n}) + \gamma E_t(y_t).$$

The model incorporates interest-rate smoothing such that

$$(6) \quad r_t = \rho r_{t-1} + (1 - \rho)r_t^* + v_t$$

where $1 \geq \rho \geq 0$ and v_t is a random shock to the interest rate that is assumed to be i.i.d.

Substitution produces the equation to be estimated

$$(7) \quad r_t = \rho r_{t-1} + (1 - \rho)\alpha + (1 - \rho)\beta \pi_{t+n} + (1 - \rho)\gamma y_t + \varepsilon_t$$

where $\varepsilon_t = v_t + (1 - \rho)\beta u_{t+n}^\pi + (1 - \rho)\gamma u_t^y$, $u_{t+n}^\pi = \pi_{t+n} - E_t(\pi_{t+n})$, and $u_t^y = y_t - E_t(y_t)$.

In the equation, r_t is the nominal interest rate, π_{t+n} is the targeted inflation rate (with $n=12$), and y_t is the output gap. The output gap is measured as the percent deviation of log-industrial production from its trend.¹¹ The estimated parameters from each central bank's reaction function can be used to measure the degree to which each bank targets long-run price stability versus smoothing short-run economic fluctuations. These are reflected in the estimates β and γ , respectively. Thus, an obvious measure of central bank activism is the ratio γ/β . A higher magnitude of the ratio γ/β shows that central bank policy was relatively more active in targeting the output gap, and thus exhibited a higher degree of monetary activism.

We estimate this Taylor rule model for each country using monthly data from January 1979 to December 1998.¹² Again following Faust, Rogers, and Wright (2001), we used an instrumental variable approach. For instruments of the targeted inflation rate and the output

¹¹We measured the output gap by the percent deviation of the log-industrial production from a linear trend. The results using a linear trend are close to those using deviations from a quadratic trend.

¹²Clarida, Gali and Gertler (1997, 2000) advise the use of long time spans to improve the accuracy of the coefficient estimates. To see whether it significantly affected our results, the estimations were also run omitting the years 1990–93, the period referred to as the hard Exchange Rate Mechanism. These years were omitted because Clarida, Gali and Gertler (1997) argued that the national central banks had lost all control of their monetary policy to the dominant Bundesbank during this period. Results after the omission showed an even clearer distinction between the two groupings of central banks than the ones presented in Table 1. We estimated the Taylor rule using data from the International Financial Statistic CD-ROM.

gap, we used six lagged values of the interest rate, inflation, and the output gap. The resulting γ/β ratios from our estimations are presented in the final column of Table 1 for easy comparison to the more simple measures of monetary activism.

The results of this estimation process are similar to the three simple measures. According to the ratios, the national central banks again show two clear groupings with Italy, France, and Spain being the most active and Austria, Belgium, and Germany being the least active of the old national central banks prior to the formation of the EMU.¹³

As was discussed earlier, the charter of the new ECB explicitly guides it toward a less active, and more monetarist, policy stance. However, we thought it still might be worthwhile to compute our measures of monetary activism for the new ECB for comparison. Unfortunately, there are two problems. First, there exists a significantly shorter length of data available on the ECB relative to the old national central banks. Not only does this lessen the accuracy of any estimates, it also makes it impossible to obtain meaningful estimates from the Taylor rule model. Thus, we are only able to present our simpler measures of activism for the new ECB. We are encouraged, however, that our earlier results suggest that these simpler measures appear to provide essentially the same results as does the more sophisticated Taylor rule model.

The second problem is that underlying economic conditions in the post-EMU era may have been significantly different from the underlying economic conditions in the pre-EMU era, clouding any meaningful comparison. Had the ECB been around during this earlier period, and had followed the same policy rules, its observed behavior might have either been more or less active than its observed behavior in the post-EMU era. This is precisely the reason why we have presented the measures both in absolute terms and also relative to the United States. By normalizing around U.S. policy, this might help to control for any differences in underlying economic conditions that might have caused a change in observed activism, particularly because the Fed retained the same chairman during the entire sample period. This procedure allows us to make sure that differences in the economic conditions between the two time periods are not driving the

¹³While we do not present the individual estimates for γ and β it is worthwhile to mention that Germany, Austria, and Belgium had the lowest magnitude of the parameter γ even without it being in ratio with β . In addition, only Germany, Austria, and Belgium had values of $\beta > 1$ (implying that the central bank increased the nominal interest rate in response to inflationary pressures enough so that the real interest would rise) and therefore actively fought inflation, again showing their more monetarist stance.

results we find by looking at the absolute measures. However, we still present the data for the absolute measures (the ones not relative to the United States) to show the strong robustness of our results regardless of whether we make this adjustment or not.

The results on relative volatility of the ECB's money supply growth rate, as well as the volatility of both nominal and real short-term market interest rates are shown in the final row of Table 1.¹⁴ For all of the indicators, the ECB shows much less activism than the old national central banks.

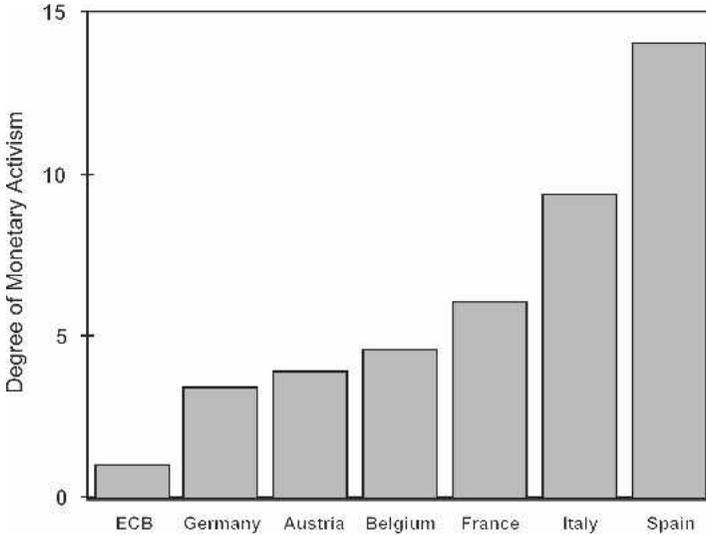
Figure 1 presents data that make it somewhat easier to compare the degree of activism across old national central banks, and relative to the new ECB. Because we have several measures of monetary activism, we simply average them and the data illustrated in Figure 1 present a bar chart of these average values. In the figure, it is clear that monetary policy under the new ECB is less active than under the old national central banks. In particular, the ECB's monetary policy is much, much less active than the old national central banks of Spain and Italy. Recall, Salvatore (2002) found that of the EMU countries, Spain and Italy suffer from the most severe asymmetric shocks and would be the two countries that would suffer from greater economic instability after joining the EMU (because the new ECB will be unable to actively offset economic shocks like the very active national central banks did).¹⁵

In the only other related study discussing the activism of the new ECB relative to the old national central banks, Faust, Rogers, and Wright (2001) find that the ECB is a little less hard-nosed on inflation when compared with the old German Bundesbank. This is not directly at odds with our findings, though, because we attempt to look at activism, rather than the degree to which they attempt to maintain stringent price stability. However, it might suggest that it would be possible to construct alternative measures that might find the new ECB to be slightly more active than the old German Bundesbank, and perhaps almost equally as active as the old central banks of Austria and Belgium.

¹⁴For further comparisons, results are presented for the Federal Reserve Bank for the periods 1987:01 to 1998:12 and 1999:01 to 2001:12. The data on the U.S. M2 is from the Federal Reserve Bank of St Louis.

¹⁵The high degree of monetary activism of Italy and Spain is not only confirmed with regard to variance in monetary aggregates, but this is also reflected in the Taylor rule measure isolating the activism specifically with respect to responding to short-run economic fluctuations.

FIGURE 1
COMPARISON OF MONETARY ACTIVISM AMONG CENTRAL BANKS



NOTE: The degree of activism is measured as the average of all simple measures presented in Table 1.

Have Economies under the ECB become More or Less Stable?

Our results suggest that the new ECB is a very inactive central bank, particularly when compared with the old national central banks of countries such as Italy, Spain, and France. In this section we attempt to see whether the economies of these countries have become more or less stable now that they are under a central bank that is less responsive to the short-run economic fluctuations they face. Several measures of the change in economic stability for these countries since the creation of the ECB are shown in the upper portion of Table 2. The lower portion of the table presents similar results for Denmark, Sweden, and the United Kingdom (the three countries who are part of the EU but who did not join the EMU). The results for these three countries will be presented and discussed at the end of this section, so for now readers may ignore the bottom portion of the table.

The volatility of the output gap, measured as the variance of the percent deviation of log-monthly industrial production from its trend, was used to measure the stability of each economy. The first column

TABLE 2
CHANGE IN ECONOMIC VOLATILITY SINCE JOINING THE EMU

Country	Change in Variance of Output Gap	Percentage Change in Output Gap Volatility	Percentage of Pre-EMU Windows with More Output Volatility	Change in Variance of Stock Returns	Percentage Change in Stock Market Volatility	Percentage of Pre-EMU Windows with More Stock Market Volatility
			<i>Nonactive National Central Banks prior to EMU</i>			
Germany	1.64	48%	0%	0.0003	68%	0%
Austria	-9.29	-47	61	-0.0001	-8	28
Belgium	-3.33	-20	23	0.0004	147	0
			<i>Active National Central Banks prior to EMU</i>			
France	-6.23	-79%	68%	0.0001	19%	7%
Spain	-12.13	-86	100	-0.0003	-36	40
Italy	-4.58	-66	100	-0.0004	-40	100
			<i>Countries that Are in the EU but Did Not Join EMU (control group)</i>			
U.K.	0.64	77%	0%	0.0001	27%	0%
Denmark	-2.88	-29	31	0.0002	51	0
Sweden	2.69	28	0	0.0011	164	0

NOTES: For the period before the EMU, the start of the data set correspond to the time when the countries ratified their entry to the European Union. For Germany, Belgium, France, Spain, and Italy, the pre-EMU period spans from 1992:11 to 1998:12. For Austria and Sweden, the pre-EMU period starts in 1993:01 to 1998:12. For the period post-EMU, the data span from 1999:01 to the most recent data available, which is generally July 2001.

of Table 2 reports the changes in output gap variance measured as the variance post-EMU minus the variance pre-EMU.¹⁶ Thus, a negative number implies that the country's economy has become more stable under the new ECB, while a positive number would imply the economy has become less stable. The second column of data shows this change as a percentage of the old degree of variance.

The changes in the output gap variance show that the economies of Austria, Belgium, France, Spain, and Italy have all become more stable under the new ECB, in contrast to what the previous literature on asymmetric shocks predicted, particularly for Spain and Italy. Not only have these economies become more stable, the increase in stability appears to be closely related to the degree of activism of the old national central bank. It is precisely those countries like Spain and Italy that had the most active national central banks that have gained the most stability from moving under the relatively nonactive ECB. Using the output gap variance measure, only Germany has become less stable, although only slightly so. The fact that Germany was the least active of the old national central banks is again supportive of the predictions based on monetarist theory. While our data showed Germany to be slightly more active than the new ECB, recall that Faust, Rogers, and Wright (2001) suggested that the ECB was actually slightly more active than the German Bundesbank. If this is true, this finding of reduced stability is exactly in accord with the prediction of the monetarist position that as Germany moved under a more active central bank, it lost economic stability.

The data presented in Table 2 is evidence in favor of the monetarist critique of the activist position because it suggests that the new ECB's inability to respond to these asymmetric shocks has actually resulted in greater economic stability. Most important, the increases in stability are undeniably bigger for the three countries whose old national central banks were the most active in pursuing short-run economic stabilization (France, Spain, and Italy) than they are for the three countries with the least active old national central banks (Germany, Austria, and Belgium). Thus, the countries experiencing the largest stability gains from being under the ECB are precisely those countries

¹⁶The pre-EMU period begins with the month each country joined the European Union and continues through 1998:12, and the post-EMU period spans from 1999:01 to the most recent data available (generally July 2001). An earlier draft of this study used a much longer pre-EMU data period, but many readers were worried that the formation of the EU might itself have increased the stability of the countries and be driving our results. Thus, we have chosen to restrict our pre-EMU sample to only data since the formation of the EU. The results using the longer sample were virtually identical, although marginally stronger, than those presented here.

whose old national central banks were the most active. This would appear to be very strong evidence again in favor of the monetarist view that an active central bank, even though it has good intentions, results in less economic stability.

One obvious critique of these data is that it is possible that the post-EMU era has just simply been different from the pre-EMU era in that all of the world's economies have been more stable. However, this would not explain why it is precisely those countries with the most active old national central banks that have experienced the greatest gains in economic stability. Nonetheless, in an effort to ensure this alternative explanation was not responsible for driving our results, we decided to compare the output gap variance in the post-EMU period against all *equally sized* smaller windows of data in our pre-EMU data. The third column of Table 2 reports the percent of pre-EMU windows that had higher output gap variances compared with the single post-EMU window. It is interesting to note that Italy, France, and Spain had 100 percent, 68 percent, and 100 percent, respectively, of their pre-EMU window variances that were higher than the post-EMU variance. This means for Italy and Spain the period after joining the EMU has been characterized by more economic stability than *any other* equally lengthy period before the EMU. Thus, this group of countries with the most active old national central banks is exhibiting greater stability under the ECB than in the vast majority of equally sized windows in the pre-EMU period. On the other hand, the percentages for Germany, Belgium, and Austria (the three countries with relatively inactive old national central banks) are substantially lower at 0 percent, 23 percent, and 61 percent, respectively. Again, this group of countries has experienced either none, or at best small, stability gains compared with the countries with the more active national central banks.

To further check the robustness of our results, Table 2 also reports similar data for the volatility of financial markets in these countries measured with each country's monthly stock market index (including withholding taxes).¹⁷ We thought this would be an interesting second variable to consider because not only is financial stability closely linked to the overall stability of the economy, but also because stock prices incorporate a significant amount of discounted information about future economic conditions. A decrease in the volatility of stock market returns implies greater stability of the financial system. The

¹⁷The pre-EMU period covers the period starting with the country's ratification to join the European Union to 1998:12 and the post-EMU period covers the period 1999:01 to 2001:07. The data are from Morgan Stanley Capital International.

final three columns of Table 2 report the changes in the volatility of stock market returns, again measured as the variance post-EMU minus the variance pre-EMU.¹⁸

Using this alternative measure of economic stability generally tells the same story. The two countries with the most active national central banks, Spain and Italy, have gained substantial economic stability since joining the EMU. The stability of stock market returns has also become more stable for Austria, although by not nearly as much. The results for the country with the least active old national central bank, Germany, again suggest a slight decrease in economic stability since joining the EMU. The stock market results for Belgium and France are the only ones that do not correspond to the same conclusion reached from measuring economic stability by examining the output gap.

At this point, the most compelling counterhypothesis to the one we present is that all European economies have simply become more stable in the post-EMU period (perhaps because of the EU itself). The obvious test of this is to compare the change in economic stability for these EMU countries to the three European countries that are in the EU but did not choose to join the EMU (United Kingdom, Denmark, and Sweden), and instead kept their own national central banks in place. The results for these three countries that serve as a “control group” are presented in the lower portion of Table 2. Since these countries did not join the EMU, and are under the same national central bank as they were before, the changes in economic stability for them should be a benchmark to which the EMU countries can be compared.

The output gap measure shows that two of these three non-EMU countries have had less economic stability in the post-EMU period than the pre-EMU period, while the stock market volatility measure shows all three to now have less economic stability. These data clearly show that the stability gains we find for the EMU countries were not similarly experienced by the other EU countries that did not join the EMU, thus ruling out this competing hypothesis that might explain our findings.

The evidence presented in this section strongly suggests that there is little evidence to support the previous literature’s contention that these EMU economies (particularly Spain and Italy) would become less stable after coming under the new ECB because of its inability to tailor monetary policy to the needs of each country. In fact, the evidence seems to suggest just the opposite. We find that the economies of

¹⁸Stock market return is calculated as the log difference of the stock market index.

these countries have become more stable under the new ECB. This has important implications for the future of the EMU because quite a substantial body of literature has used this idea as the basis for an argument that the EMU would eventually collapse as these countries left the EMU because of the decreased economic stability they would experience.

Our empirical results for Spain and Italy can be explained in one of two ways: either Spain and Italy have benefited from being under a central bank that is unable to respond to their asymmetric shocks (the monetarist position), or the two countries have yet to experience asymmetric disturbances at all. The fact that both Spain and Italy have experienced more output stability in the post-EMU era than in all of the equally sized periods of time during the 20 years before the formation of the EMU seems to suggest the former, particularly since during this same post-EMU period there was less output stability for the control group countries such as Sweden and the United Kingdom than during the pre-EMU period. Thus, we believe the data show clearly that the inability of the new ECB to be able to react to all of the asymmetric shocks occurring in these countries has resulted in more stability, not less—a finding that is consistent with a monetarist view of monetary-policy ineffectiveness.

Also consistent with the hypothesis we derive from the monetarist position is our finding that the EMU countries whose economies have exhibited the greatest gains in economic stability since coming under the new ECB are precisely those countries whose old national central banks were the most active in pursuing short-run economic stabilization. In particular, Italy and Spain, the two countries with the most active national central banks, have been the ones that have shown the greatest *improvements* in stability, while at the same time these stability gains have not occurred for countries in the EMU who already had a relative inactive national central bank (like Germany) nor for countries who are in the EU but did not join the EMU (like Sweden and the U.K.).

Conclusion

The results of this study have significant implications both for the future of the EMU specifically, and for the effectiveness of activist stabilization policy more generally. Despite the predictions that these European economies would begin to suffer wider swings in economic activity under a common central bank that is unable to “optimally” respond to the asymmetric shocks faced by each nation, they have not. In fact, we find that all of these economies have become more

stable after coming under the ECB with the exception of Germany that already had a relatively inactive central bank. Because this prediction of increased instability was the basis for predictions that claimed that the EMU would be doomed in the long run, our results suggest a much rosier picture for the future of the EMU.

Our explanation for the observed data is that despite good intentions, activist monetary policy is simply unable to deliver on its promise, and that activist policy is actually counterproductive to the achievement of economic stability. If this explanation is correct, it brings into question the entire theory of optimal currency areas. If common central banks are activist, but react to the average economic conditions in the entire area, and these activist policies are actually counterproductive, then it would appear that merging unlike economies into a common currency area would actually result in more stability than would merging similar economies because it would result in a less active common central bank. One can easily imagine how the calculus of an optimum currency area model would change after adding in monetary policy timing errors and a central bank that responds to the average economic conditions. Our conclusions with regard to optimal currency area (OCA) theory can be viewed as supportive of the conclusions reached in the relatively new “endogenous OCA” literature pioneered by Frankel and Rose (1998), Rose (2000), and Rose and van Wincoop (2001).¹⁹

Not only do our results find increased economic stability after coming under the relatively inactive ECB, but they also show that the countries experiencing the greatest gains in stability are precisely those whose old national central banks practiced the highest degree of activist stabilization. This is highlighted by the stability gains of Italy and Spain whose national central banks were characterized by highly active responses to short-run output fluctuations. These data are particularly convincing when these countries are compared with countries that used to have relatively nonactive central banks (such as Germany) and to the countries in the EU that did not join the EMU

¹⁹Frankel and Rose (1998) argue that sharing a same currency results in closer trade relations that cause the business cycles across countries to converge. Because synchronized business cycles are one of the major criteria for the creation of an optimal currency area, their findings emphasize the fact that the conditions of an optimum currency area may be met *ex post*, rather than *ex ante*. Rose (2000), and Rose and van Wincoop (2001) reiterate the economic benefits experienced by a country that joins a currency union and the endogeneity of the optimum currency area criteria. Their conclusion meets ours in that the choice of joining the EMU should not depend on the optimum currency area criteria. Like us, they believe that the benefits of a currency union have been understated in the literature and, that the potential gains of joining the EMU should influence more countries to give up their monetary sovereignty.

(United Kingdom, Sweden, and Denmark). This is our strongest evidence against the alternative explanation that all of these countries have simply had greater underlying economic stability in the post-EMU era. The increase in stability that we find is consistently and predictably related to the degree of activism of the old national central bank, and is not simply a uniform improvement across all of the countries. The countries that have had the greatest reductions in monetary activism have gained the most in economic stability. The results simply and clearly suggest that a less active central bank that is committed to price stability results in greater macroeconomic stability.

The underlying implications of this latter finding should be obvious. Activist stabilization policy on the part of central banks, while well-intentioned, actually leads to less economic stability. Because the effectiveness of activist monetary policy has been an area of significant debate among economists over the past three decades, being able to find such a unique opportunity to test it in such a clear, straightforward manner has significant value. Monetary theories based on mathematical models that build in an assumption that monetary activism is effective (such as the asymmetric shock theory for the EMU or theories of optimum currency areas) are simply unable to deliver predictions that fit the real-world data for the EMU. We hope that our findings would encourage readers to be skeptical of the predictions of monetary theories that do not incorporate the monetarist critique and simply assume the effectiveness of monetary activism.

Of course, it has only been three years since the formation of the EMU, a period finally long enough to begin to test for many of the economic changes that have occurred as a result of this transformation in Europe. However, as more time passes, and greater spans of post-EMU data become available, more reliable estimates will be possible. While the data now available are sufficient from an econometric standpoint to allow us to get reliable estimates, more data always improve the accuracy of the estimates obtained from any empirical analysis. We are confident that the study of the effects of the formation of the EMU will generate many new and significant insights that will allow the profession to settle some of the major debates remaining in macroeconomic theory about the effectiveness of monetary activism.

References

- Barro, R. (1996) "Inflation and Growth." Federal Reserve Bank of St. Louis *Review* 78: 153–69.

- Bayoumi, T., and Eichengreen, B. (1993) "Shocking Aspect of European Monetary Unification." In B. Eichengreen (ed.) *European Monetary Unification, Theory, Practice, and Analysis*, 73–109. Cambridge: MIT Press.
- (1997) "Ever Closer to Heaven? An Optimum Currency Area Index for European Countries." *European Economic Review* 41: 761–70.
- Bernanke, B. S., and Blinder, A. S. (1992) "The Federal Funds Rate and the Channels of Monetary Transmission." *American Economic Review* 82: 901–21.
- Bernanke, B. S., and Mihov, I. (1995) "Measuring Monetary Policy." NBER Working Paper No. 5145.
- Brainard, W. (1967) "Uncertainty and the Effectiveness of Policy." *American Economic Review* 57: 411–25.
- Brunner, K. (1985) "Monetary Policy and Monetary Order." In K. Brunner, et al. (eds) *Monetary Policy and Monetary Regimes*. Center for Research in Government Policy and Business, Number CS-17, Rochester N.Y.: Graduate School of Management, University of Rochester.
- Caporale, T., and Grier, K. B. (1998) "A Political Model of Monetary Policy with Application to the Real Fed Funds Rate." *Journal of Law and Economics* 41: 409–28.
- Clarida, R., J.; Gali, J.; and Gertler, M. (1997) "Monetary Policy Rule in Practice: Some International Evidence." *European Economic Review* 42: 1033–67.
- (2000) "Monetary Policy Rules and Macroeconomic Stability: Evidence and Some Theory." *Quarterly Journal of Economics* 115: 147–80.
- De Grauwe, P. (2000) *Economics of Monetary Union*. Oxford: Oxford University Press.
- Duisenberg, W. F. (1999) "Economic and Monetary Union in Europe: The Challenges Ahead." In *New Challenges for Monetary Policy*. Federal Reserve Bank of Kansas City.
- Eichengreen, B. (1992). "Is Europe an Optimum Currency Area?" In H. Grubel and S. Borner (eds) *The European Community after 1992: Perspectives from the Outside*, 138–61. Basingtoke, England: Macmillian.
- Ellison, M., and Valla, N. (2000) "Learning, Uncertainty and Central Bank Activism in an Economy with Strategic Interactions." European Central Bank, Working Paper No 28.
- Faust, J.; Rogers, J. H.; and Wright, J. H. (2001) "An Empirical Comparison of Bundesbank and ECB Monetary Policy Rules." Federal Reserve Board International Finance Discussion Papers, No.705.
- Feldstein, M. (1997) "The Political Economy of the European Economic and Monetary Union: Political Sources of an Economic Liability." *Journal of Economic Perspectives* 11: 23–42.
- (2000) "The European Central Bank and the Euro: The First Year." *Journal of Policy Modeling* 22: 345–54.
- Frankel, J., and Rose, A. (1998) "The Endogeneity of the Optimum Currency Area Criteria." *The Economic Journal* 108: 1009–25.
- Friedman, M. (1961) "The Lag in Effect of Monetary Policy." *Journal of Political Economy* 69: 447–66.
- (1968) "The Role of Monetary Policy." *American Economic Review* 58: 1–17.

- Grier, K. B. (1984) "The Political Economy of Monetary Policy." Ph.D. dissertation, Washington University, St. Louis.
- _____ (1989) "On the Existence of a Monetary Cycle." *American Journal of Political Science* 33: 376–89.
- Hafer, R. W., and Kutan, A. M. (2002) "Detrending and Money-Output Link." *Southern Economic Journal* 69: 159–74.
- Hafer, R. W., and Wheelock, D. C. (2001) "The Rise and Fall of a Policy Rule: Monetarism at the St. Louis Fed, 1968–1986." Federal Reserve Bank of St. Louis *Review* 83: 1–31.
- Martin-Das, J. (2002) *The European Monetary Union in a Public Choice Perspective: A Political-Economic Approach to the Implications of Macroeconomic Shocks*. Northampton, Mass.: Edward Elgar.
- Meltzer, A. H. (1987) "Limits of Short-Run Stabilization Policy: Presidential Address to the Western Economic Association, July 1986." *Economic Inquiry* 25: 1–14.
- _____ (2001) "Money and Monetary Policy: An Essay in Honor of Darryl Francis." Federal Reserve Bank of St. Louis *Review* 83: 23–31.
- Mundell, R. (1961) "A Theory of Optimum Currency Areas." *American Economic Review* 51: 657–65.
- Orphanides, A. (1998) "Monetary Policy Evaluation with Noisy Information." Federal Reserve Board Finance and Economics Discussion Series No.50.
- _____ (2000) "The Quest for Prosperity without Inflation." European Central Bank Working Paper No. 15.
- _____ (2002) "Monetary Policy Rules and the Great Inflation." *American Economic Review* 92: 115–20.
- Phelps, E. (1968) "Money Wage Dynamics and Labor Market Equilibrium." *Journal of Political Economy* 76: 678–711.
- Rasche, R. H., Thornton, D. L. (2001) "The Monetary/Fiscal Policy Debate: A Controlled Experiment." *Monetary Trends*, Federal Reserve Bank of St. Louis.
- Rose, A. (2000) "One Money, One Market: Estimating the Effect of Common Currencies on Trade." *Economic Policy: A European Forum* 30: 7–33.
- Rose A., and van Wincoop, E. (2001) "National Money as a Barrier to International Trade: The Real Case for Currency Union." *American Economic Review* 91: 386–90.
- Salvatore, D. (2002) "The Euro, the European Central Bank, and the International Monetary System." *Annals of the American Academy of Political and Social Science* 579: 153–67.
- Sims, C. A. (1972) "Money, Income and Causality." *American Economic Review* 62: 540–42.
- _____ (1992) "Interpreting the Macroeconomic Time Series Facts: The Effects of Monetary Policy." *European Economic Review* 36: 975–1011.
- Stevens, E. (1999) "The Euro." *Economic Commentary*, Federal Reserve Bank of Cleveland.