CHAPTER 3

Evidence of Monetary Divergence

The first research question posed in chapter 1 asked if we can observe much evidence of widespread, or systematic, monetary policy convergence among the OECD countries in the post–Bretton Woods era. In response to this question, conventional wisdom answers in the affirmative: monetary policy convergence can be seen in the series of monetary and exchange rate regimes developed in Western Europe since the end of the Bretton Woods era in the early 1970s. Furthermore, many other governments not participating directly in these multilateral regimes made similar unilateral commitments to peg their national currencies, thus also committing them to the path of external monetary convergence for exchange rate stability.

However, as was discussed in chapter 2, we cannot judge external monetary convergence and the loss of domestic monetary autonomy simply by looking at whether or not a government has made a de jure commitment to stabilize its exchange rate, either unilaterally or within a multilateral currency arrangement, such as the European Snake or the European Monetary System. These exchange rate regimes were quite flexible arrangements allowing member states to maintain a surprisingly high degree of domestic policy autonomy if they so desired it. Thus, for every state achieving relative currency stability within the exchange rate mechanism (ERM) of the EMS, such as Belgium and the Netherlands, it is possible to identify another state asserting domestic policy autonomy with more variable exchange rates within the regime, such as France[1] or Italy.[2] Barnes (1996, 173) observed, "The ERM currencies often

1. France under Socialist Party governance is one of the two case studies in chapter 6.

2. Despite the wider bands granted to the government, Italy nonetheless realigned its currency within the EMS on a fairly regular basis. Gros and Thygesen (1992, 68) documented twelve multiple currency realignments inside this regime from 1979 through 1990, with Italy participating in nine (in September 1979, March 1981, October 1981, June 1982, March 1983, July 1985, April

appeared no more stable than other currencies, [and] the inflation rates were similar to those found world wide."[3]

In addition, for every state achieving relative exchange rate stability with a unilateral commitment to peg its currency, such as Austria, it is possible to identify another state with a very flexible unilateral peg, such as Sweden.[4] Finally, many states with no formal commitments to fix the value of their national currencies nonetheless achieved a significant degree of exchange rate stability: two examples are the United Kingdom,[5] especially in the late 1980s, and Japan.[6] Various economists have extensively documented the historical disconnect between governments' stated monetary commitments and the actual stability of national currency values (see, e.g., Reinhart and Rogoff 2004; Shambaugh 2004; Levy-Yeyati and Sturzenegger 2005). For scholars of international monetary politics, the observed gap between such monetary "words and deeds" (see Levy-Yeyati and Sturzenegger 2005) means that we cannot treat fixed exchange rate commitments in any form as simple proxies for external currency stability and the corresponding loss of domestic policy autonomy. We also cannot treat the lack of any formal monetary commitments as prima facie evidence of domestic policy autonomy with exchange rate volatility.

Thus, to move forward in determining whether there has been systematic monetary policy convergence among the advanced industrial democracies in the post–Bretton Woods era, we clearly need a better way to measure external

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1986, January 1987, and January 1990). The cumulative currency adjustment during this period was greater for Italy than for any other EMS member state.

3. For additional evidence on this point, see Grilli, Masciandro, and Tabellini 1991; Froot and Rogoff 1991; Eichengreen 1992; Fratianni and von Hagen 1992; Woolley 1992.

4. The Swedish exchange rate peg was flexibly constructed, and Social Democratic governments devalued the krona for competitive reasons on a regular basis, especially in the early 1980s. As Bernanke et al. (1999, 176–77) concluded, the "changes over time in the definition of the [Swedish] exchange-rate target, in response to changing circumstances, illustrate how a degree of flexibility may be introduced even into supposedly inflexible monetary regimes." Aylott (2001, 161) and Moses (1998, 207) made very similar arguments about how the unilateral Sweden exchange rate peg disguised a high degree of Swedish monetary independence.

5. The United Kingdom under Conservative Party governance is the second case study in chapter 6.

6. As Henning (1994, 121) explained, "exchange rate policy has consistently been an element of overall economic strategy in Japan" despite the lack of external currency commitments. Cargill, Hutchison, and Ito (1997, 62) similarly concluded: "International factors, such as the exchange rate, the balance of payments, and efforts to coordinate policy internationally, have influenced the conduct and control of Bank of Japan policy. Even after the breakup of the Bretton Woods system, but especially after the Plaza Agreement of 1985, the Bank of Japan remained very much concerned with external factors in formulating monetary policy despite the lack of formally binding exchange-rate and balance of payment constraints."

monetary policy convergence under the condition of international capital mobility. This is all the more true since political scientists have been using the term *monetary policy autonomy* for over a decade without defining precisely what they mean. Much as was the case with Justice Stewart's infamous definition of obscenity—"I know it when I see it"—the lack of a precise operational definition precludes scholarly progress.

This chapter proceeds in three sequential steps. The first step is to present a precise operational measure for external monetary convergence, or the loss of domestic monetary autonomy; the operational definition is borrowed from the interest parity condition in open-economy macroeconomics. The second step is to validate the measure using a construct validity test provided by the Mundell-Fleming framework. Having demonstrated its validity, we can then proceed to the third, final, and most important step in this chapter: assessing the extent of external monetary policy convergence among the OECD economies after 1973.

While the evidence suggests an important international capital mobility constraint on national monetary policy in the post–Bretton Woods era, there is little evidence of external monetary convergence on any systematic basis. Thus, the fact that international capital mobility constrains national monetary policy choices does not mean that it has also produced systematic monetary convergence. While some OECD governments have moved toward greater external monetary convergence, many others retained a significant amount of domestic monetary autonomy, despite the costs associated with this choice. Consequently, the post–Bretton Woods era is better characterized by the concept of monetary policy divergence, defined as the situation where OECD governments have used their national monetary policy for different purposes, with some working for greater external currency stability while many others pursued domestic monetary autonomy.

1. Measuring External Monetary Convergence

To measure the extent of external monetary convergence and its converse, domestic monetary autonomy, I propose an operational indicator from the field of open-economy macroeconomics. Economists commonly express the monetary autonomy–exchange rate stability trade-off under full capital mobility in terms of an interest parity condition (see Rose 1994, 30).[7]

7. Rose (1994, 30) presented a continuous-time version of uncovered interest parity. Here I present the discrete-time equivalent.

$$\Delta e = i - i^* \tag{3.1}$$

Equation (3.1) is known as uncovered interest parity, where Δe is a measure of exchange rate movements, i represents the domestic interest rate, and i^* represents the prevailing external, or world, interest rate. This equation states that the expected change in the exchange rate e is given by a nominal interest rate differential, the domestic interest rate minus the external interest rate. If a government wants to keep its exchange rate stable ($\Delta e \rightarrow 0$), then it must move its domestic interest rate in line with the prevailing world interest rate ($i \rightarrow i^*$). This movement of domestic interest rates toward the world interest rate defines the process known as external monetary policy convergence. If the two interest rates are the same ($i = i^*$), then external monetary policy convergence is theoretically complete. Conversely, holding a national interest rate that differs significantly from the prevailing world interest rate can be defined as domestic monetary policy autonomy.

Political scientists seem comfortable with the idea that a negative interest rate differential ($i < i^*$) fits the definition of monetary policy autonomy. But it is important to understand that domestic policy autonomy is also consistent with a positive interest rate differential ($i > i^*$), a situation that may result from fiscal policy expansion. The relationship between national interest rates and government spending in the post–Bretton Woods era will be discussed in more detail in chapter 4. At this point, I simply state that fiscal policy looseness may produce inflationary expectations, leading governments to use their monetary policy instrument for inflation control—an internal policy goal consistent with domestic monetary autonomy[8]—rather than for the external goal of exchange rate stability. This story certainly fits the expected monetary convergence process in Western Europe, where prospective EMU member states were required to reduce their fiscal deficits and public debt and to lower nominal interest rates in order to converge on the low-inflation states in the European Union (see Watson 1997).

Some political scientists may be surprised to discover that macroeconomists measure domestic monetary autonomy by a country's nominal interest rate differential, not by its real interest rate differential. This is true not because national inflation rates are unimportant but because the nominal interest rate

8. Recall the definition of monetary policy autonomy given in chapter 2: the ability of national governments to direct monetary policy instruments toward domestic economic objectives, including national economic growth and domestic price stability. This is why economists identify an inflation-targeting monetary policy as consistent with domestic monetary autonomy (see Bernanke et al. 1999).

differential fully reflects any expected inflation differential when capital is fully mobile. To understand this logic, it is useful to rewrite the right-hand side of the interest parity condition in terms of real interest rates (r) and expected inflation rates (π): $(i - i^*) = (r + \pi) - (r^* + \pi^*)$. With full capital mobility, the real interest rate differential is assumed to be zero; hence, $r - r^* = 0$. If the real interest rate differential is not zero, capital can be expected to move until such differential real returns are equalized. With full capital mobility, the r terms effectively cancel and the nominal interest rate differential fully reflects any differential rates of expected inflation: $(i - i^*) = (\pi - \pi^*)$.[9] On this point, it is important to note that inflationary expectations often differ from actual inflation rates. Due to different policy choices made by governments, national economies may have very different inflationary expectations even when their actual inflation rates do not differ significantly.

As this logic also illustrates, real interest rate differentials signify the extent to which money can move across national borders to equalize real returns. Thus, real interest rate differentials, much like covered interest rate differentials, do not capture the concept of domestic monetary policy autonomy as it is understood in open-economy macroeconomics.[10] Instead, these interest rate differentials measure the extent of international capital mobility—an entirely different menu item in the Mundell-Fleming framework (see Frankel 1991; Shepherd 1994).[11]

Given international capital mobility, the uncovered interest parity condition offers a very tractable way to measure domestic monetary autonomy versus external monetary convergence. Using this simple measure, domestic monetary autonomy (or external monetary convergence) can be defined as the extent to which a country's nominal interest rate differs from (or approaches) the prevailing external, or world, interest rate. As face validity for this approach to measuring domestic monetary autonomy versus external monetary conver-

9. This is consistent with Moses's simple definition (1998, 214) of domestic monetary autonomy as excess inflation or, more correctly, positive inflationary expectations.

10. This is why Garrett and Lange's data (1991, 551–52) on real interest rates and real growth in money supply do not indicate monetary policy convergence. Instead, their data simply capture the fact of international capital mobility among this set of OECD economies. This is worth mentioning because their data are still sometimes cited in the literature as evidence of systematic monetary policy convergence among the OECD economies.

11. In addition to being measured by real interest rate differentials, international capital mobility has also been measured in terms of cross-border capital flows, national savings-investment coefficients, and the elimination of government restrictions on capital movements. Especially with the availability of Quinn and Inclan's (1997) data on OECD financial market openness, political scientists have tended to use the latter as the preferred measure of international capital mobility. I will do the same in the statistical models in this book.

gence, it is worth noting that Shambaugh (2004, 305–12) similarly used the interest parity condition as the basis for his examination of how national monetary policy is affected by de facto fixed exchange rates.

One possible objection to using the right-hand side of the uncovered interest parity condition as an operational indicator for domestic monetary autonomy and external monetary convergence is that it poorly predicts the direction of exchange rate movements.[12] In practice, positive interest rate differentials ($i > i^*$) are not always associated with currency appreciation. Often, a rise in national interest rates leads to currency depreciation. This directional ambiguity appears related to how international investors, with differing risk profiles, interpret a rise in national interest rates (see Willett, Khan, and Der Hovanessian 1985). If interpreted as a signal of higher returns on investments in the domestic market, it should lead to a currency appreciation. If viewed instead as a sign of increasing domestic inflationary expectations, then a rise in national interest rates may produce a depreciated currency.

This directional ambiguity does not mean that with international capital mobility, there is no trade-off between monetary policy autonomy and exchange rate stability. But it does suggest the need to consider an alternative measure of exchange rate instability, one that captures currency movements in both directions. Thus, I choose to measure national exchange rate variability in terms of a coefficient of variation (Ve), replacing the Δe term on the right-hand side of equation (3.1). The coefficient of variation captures the relative variability of the national currency measured against some external benchmark but makes no distinction with regard to the direction of exchange rate movements.[13]

At this point, it is important to state that I cannot and will not make any arguments about the direction of exchange rate movements or even about exchange rate levels in the post–Bretton Woods era. To do so would clearly require a different monetary model, and I leave this task to other scholars. That being said, the use of a directionless measure of national currency variability has now become a standard way to capture exchange rate instability (see, e.g., Rose 1994; Frieden 2002; Levy-Yeyati and Sturzenegger 2003, 2005). The big-

12. On this point, see Fama 1984; Frankel and Froot 1989.

13. The coefficient of variation (Ve) is calculated by dividing the standard deviation of exchange rate levels over a particular period (σe) by the mean value over the same period. In the pooled time-series models in this book, it would be incorrect to use the simple standard deviation statistic, which is an absolute measure of variability and, thus, is affected by the unit of measurement (i.e., the national currency unit), since the unit of measurement differs for each country in the sample.

ger question concerns the choice of an appropriate external benchmark against which to measure annual OECD national currency variability.

Scholars often use a single currency benchmark; for example, Frieden (2002) measured national currency variability versus the German mark. While this might be appropriate for the narrow sample of countries around Germany,[14] variability versus the German mark is clearly an unsuitable measure for the larger OECD sample including many countries in North America and the Pacific. Indeed, one of the major critiques of the systematic monetary convergence hypothesis was that its few empirical investigations tended to focus almost exclusively on its most favorable cross-sectional domain: countries in Western Europe or, even more narrowly, those within the European Union. If systematic monetary convergence is occurring in the post–Bretton Woods era—whether due to international capital mobility, neoliberal policy ideas, or interest group pressures—then the hypothesis must be tested on a much broader cross-sectional sample, which requires a different external currency benchmark.

Another possible single currency benchmark would be the U.S. dollar, as employed by Rose (1994), following the logic that the American currency has served more as a global currency than has the German mark. But a U.S. dollar benchmark would be potentially problematic for the sizable number of EU member states who have focused more on exchange rate stability versus the German currency than the U.S. dollar, at least since the late 1970s. Thus, we clearly need to measure national exchange rate variability relative to a broad basket of external currencies.

One obvious possibility would be to create a trade-weighted and capital-weighted measure of national currency variability. In practice, however, such a measure is problematic to construct for at least two reasons. First, the data on

14. It is arguably not even appropriate for this narrow sample. Given a theoretical story beginning with the preferences of diversified economic actors (exporters and investors) and their propensity to pressure governments when exchange rates become excessively unstable, any measure of exchange rate variability using a single currency benchmark, including the German mark, could be invalid. The potential validity problem can be illustrated with a series of examples: less than one-sixth of British exports, less than one-fifth of French and Italian exports, less than one-fourth of Belgian exports, and less than one-third of Dutch exports went to Germany in 1992, even though Germany is the largest trading partner of each of the corresponding states. Thus, even when using an all-European sample of countries, measuring currency variability relative to only the German mark might seriously misrepresent how much exchange rate instability is actually experienced by diversified traders and investors. Given a broader OECD sample, the validity problem would grow. At least in theory, when these economic actors encounter undesirable currency movements in one market, they can shift their business activities to other markets as an alternative to costly lobbying for exchange rate stability.

bilateral capital flows are extremely poor even for the advanced industrial democracies. Second and more important, if currency variability is supposed to determine trade levels (a common argument in the monetary convergence literature for why actors prefer fixed and stable exchange rates), then any trade-weighted measure of currency variability suffers from a serious endogeneity problem: trade levels are used to create the measure of currency variability, yet trade levels are also a function of currency stability.

To avoid this endogeneity problem and yet obtain an appropriately broad external benchmark, I choose to measure national currency variability relative to the Special Drawing Right (SDR), the International Monetary Fund's reserve currency based on a weighted average of the national currencies of the G-5, or Group of Five, which includes France, Germany, Japan, the United Kingdom, and the United States. This benchmark is also useful because it presents no extraordinary data demands, as national currency variability versus the SDR is regularly reported by the International Monetary Fund (IMF) in its *International Financial Statistics.* Inasmuch as the IMF basket currency reflects the value of three European currencies, including the German mark, French franc, and British pound, it serves as a suitable benchmark for all the European countries in the broad OECD sample used in the present study. Inasmuch as it also reflects the U.S. dollar and Japanese yen, it also serves as a suitable benchmark for the other North American and Pacific states included in the OECD sample. Finally, since each of the individual G-5 currencies experience variability versus the broader SDR benchmark, it is not necessary to exclude any G-5 government from my statistical analyses in this and the other chapters. This allows testing of the various arguments by using the full sample of OECD countries in the post–Bretton Woods era, although it will be necessary to include country-specific fixed effects in the statistical models of exchange rate variability.

Using this weighted G-5 benchmark, I calculated the variable EXRCV to indicate yearly national currency variability for twenty-three OECD countries from 1973 to 1997.[15] I began with 1973 because it marks the start of the post–Bretton Woods era. I stopped with 1997 because it is the year in which a large group of European countries in the OECD sample were expected to be policy convergent in preparation for the final stage of the EMU.

Figure 4 plots the time-series descriptive data for this operational measure of exchange rate variability, or instability. The graph suggests some obvious

15. The exchange rate data come from the International Monetary Fund's *International Financial Statistics.* I obtained a yearly coefficient of variation using monthly exchange rate values, the least temporally aggregated value available from this source.

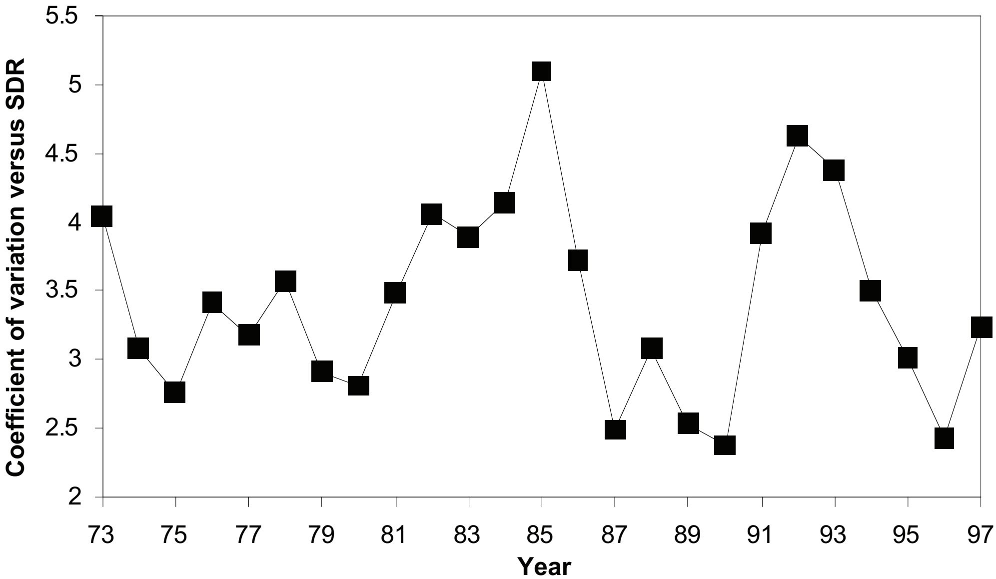

Fig. 4. Average OECD Exchange Rate Variability, 1973–97. (Exchange rate data from International Monetary Fund, *International Financial Statistics.*)

face validity, as it shows a variability spike in 1984–85 (the exchange rate instability leading to the Plaza Accord), a period of relative currency stability from 1987 to 1990 (the era of the Louvre target zone), and a final spike corresponding to the 1992 exchange rate crisis in Western Europe. These time-series descriptive data show no clear trend toward greater exchange rate stability, or less currency variability, for the OECD states in the post–Bretton Woods era. This interesting fact runs contrary to the theoretical expectations of the systematic monetary convergence hypothesis, which predicted that OECD governments would move toward exchange rate stability with greater international capital mobility after 1973 (see fig. 3 in chap. 2).

2. Validating the Operational Measures

The nominal interest rate differential measure for domestic monetary autonomy and the indicator of exchange rate variability detailed in the preceding section can and should be subjected to stronger validity tests than simple face validity.[16] One very important and straightforward construct validity test comes directly from the Mundell-Fleming framework. In the post–Bretton Woods era of international capital mobility, greater domestic monetary policy autonomy should be associated with more exchange rate variability. Thus, valid operational measures for these two theoretical concepts must exhibit a strong positive relationship.

To estimate this relationship, I begin with the simple statistical model described in equation (3.2), using the sample of OECD countries over the 1973–97 period, with country-year specified as the unit of analysis.[17]

$$\text{EXRCV}_{it} = \beta_0 + \beta_1{*}\text{MONAUT}_{it} + \alpha_i{*}\text{COUNTRY}_i + \alpha_t{*}\text{YEAR}_t + e_{it} \qquad (3.2)$$

The dependent variable, EXRCV, indicates the coefficient of nominal variation for the country's currency versus the SDR in year t. The main independent variable is MONAUT (monetary autonomy), measuring the country-year nominal interest rate differential in absolute terms ($|i - i^*|$), since domestic interest rates either below or above the prevailing external interest rate would indicate a more independent monetary policy stance. To capture most accurately the policy choice made by national monetary authorities, i is the country's policy interest rate, rather than a market interest rate.[18] The prevailing external interest rate, or world interest rate (i^*,) is calculated as the weighted (by gross domestic product) average of the G-5 countries' policy interest rates, since these countries are the world's largest capital-producing economies and, thus, effectively set the world interest rate.[19]

To control for country risk and exogenous shocks that may impact national exchange rate variability, I follow Rose (1994) in adding dummy variables for all countries in the sample except the United States and for all years except

16. On different approaches to validation, see Manheim, Rich, and Willnat 2002, 69–73.

17. There are twenty-three OECD countries in the sample, and each country was measured over twenty-five years. Thus, there are 575 country-year observations. The OECD sample consists of the following countries in alphabetical order: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

18. As the main policy interest rate, I use the federal funds rate equivalent from the International Monetary Fund's *International Financial Statistics,* line 60b, as recommended by Reinhart and Rogoff (2004, 27). When this series is missing, I use line 60c, as done in Calvo and Reinhart's 2002 study.

19. For each G-5 state in the sample, I make an important adjustment. The interest rate differential for the United States, Japan, Germany, Britain, and France is measured relative to the other G-5 states.

1973. As the errors in this time-series cross-sectional model are likely to exhibit contemporaneous autocorrelation and panel heteroskedasticity, I estimate the model using panel-corrected standard errors (PCSEs). To correct for serial autocorrelation in each country time series, I also estimate and adjust for first-order autocorrelation.[20] The results thus provide Prais-Winsten generalized least squares, rather than ordinary least squares, coefficients.

The Mundell-Fleming construct validity test requires that the MONAUT coefficient be positively signed and statistically significant. In other words, larger absolute interest rate differentials, or greater domestic monetary autonomy, should have produced more exchange rate variability in the post–Bretton Woods era, although the result cannot speak to the direction of exchange rate movements after 1973. The estimates, shown in the first column of table 2, confirm this expectation, demonstrating some important construct validity for the measures of domestic monetary autonomy and exchange rate stability that will be used here and in later chapters.

In the second column of table 2, I reestimated the equation, adding a control variable for international capital mobility. Following Clark and Reichert (1998), equation (3.2) originally assumed that capital was internationally mobile at the end of the Bretton Woods system and, thus, could be treated as a given in the post–Bretton Woods era, at least for the OECD economies. But it may be useful to control for variation with regard to capital openness after 1973.[21] Extending the data from Quinn and Inclan (1997), KOPEN (capital openness) measures country *i*'s financial openness in year *t* on a 0–14 scale, with larger values indicating more open national capital markets. The time-series descriptive data for Quinn and Inclan's measure are shown in figure 5.

20. Recent papers (e.g., Achen 2000; Kristensen and Wawro 2003) have begun to question the use of a lagged dependent variable, especially with PCSEs, as originally recommended by Beck and Katz (1995). Among other potential problems, a lagged dependent variable tends to bias other coefficients in the model toward zero. Since I will draw substantive conclusions from the statistically significant and insignificant variables, it becomes important to simultaneously minimize both Type I and Type II errors. Not correcting for serial autocorrelation tends to produce overconfident standard errors, leading to Type I errors. But the attenuation bias associated with the lagged dependent variable risks Type II errors. Keele and Kelly (2004) have shown that this bias becomes smaller with longer time series but that the bias can be quite severe with only twenty-five observation time series (as pooled here). I thus choose the AR1 (first order autoregression) correction for serial autocorrelation. Lagrange multiplier tests on the residuals after the AR1 correction reveal no statistically significant evidence of first-order serial autocorrelation.

21. As Andrews (1994b, 195) correctly noted, international capital mobility is best defined not in terms of actual capital flows but in terms of the capacity of money to move across international borders. Indeed, once real interest rates have completely converged, there may be little reason for capital to move even though it is fully able to do so.

Their data reveal that the average OECD country was already quite open in financial terms at the beginning of the post–Bretton Woods era. This is an important point to which I will return later.

With this new variable added to the model, it is important to note the prediction made by the first-wave monetary convergence hypothesis, which argued that growing international capital mobility led governments toward external monetary convergence to achieve greater exchange rate stability (see fig. 3 in chap. 2). If this monetary convergence logic is correct, the KOPEN coefficient should be statistically significant and negatively signed, indicating less national currency variability. The results in the second column of table 2 tend to disconfirm this hypothesis, as KOPEN has a weak positive coefficient. It is also interesting to note that the estimated coefficient for the MONAUT variable scarcely changes with the addition of the KOPEN control variable, demonstrating once again the strong positive relationship between domestic monetary autonomy and exchange rate variability in the post–Bretton Woods era.

TABLE 2. Estimates of the Trade-off between Monetary Autonomy and Exchange Rate Variability

	1	2	3	4	5
Constant	3.07***	2.58**	3.27***	3.27***	–0.48
	(0.35)	(1.09)	(1.18)	(1.17)	(1.28)
MONAUT	0.19***	0.18***	0.07	0.07	
	(0.04)	(0.04)	(0.13)	(0.13)	
KOPEN		0.04	–0.02	–0.02	0.29***
		(0.09)	(0.10)	(0.10)	(0.11)
MONAUT × KOPEN			0.01	0.01	
			(0.01)	(0.01)	
EMS				–0.21	–0.23
				(0.36)	(0.38)
SNAKE				–0.40	0.09
				(0.49)	(0.49)
UNIPEG				–0.08	0.25
				(0.34)	(0.38)
X^2 for country fixed effects	2709.05***	806.65***	277.97***	246.91***	489.33***
X^2 for year fixed effects	1439.35***	1303.65***	1375.65***	1468.25***	1070.98***
N	575	575	575	575	575
R^2	0.55	0.55	0.57	0.57	0.35

Note: Estimates are Prais-Winsten coefficients, including an AR1 correction, with panel-corrected standard errors in parentheses. Individual country and year dummies are not reported.

Two-tailed statistical significance is indicated as follows: ***$p < .01$, **$p < .05$, *$p < .10$.

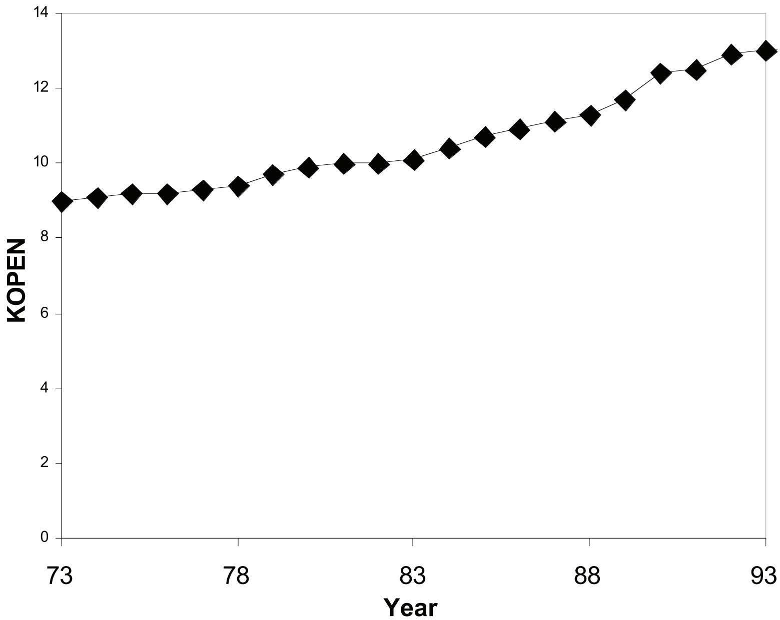

Fig. 5. Average OECD Financial Openness, 1973–93. (Data from Quinn and Inclan 1997.)

Next, I added the interaction term MONAUT*KOPEN to assess whether the trade-off between domestic monetary autonomy and exchange rate stability has strengthened with growing international capital mobility in the post–Bretton Woods era. With the interaction term, the marginal effect of MONAUT now depends on two different coefficients and the value of KOPEN: β_1*MONAUT + β_2*MONAUT*KOPEN. When KOPEN = 0 (a completely closed national capital market), the marginal effect of a one-unit increase in MONAUT is simply β1. When KOPEN = 14 (a completely open national capital market), the marginal effect of a one-unit increase in MONAUT becomes β1 + β2*14. Figure 6 plots the changing marginal effect of MONAUT given the different possible values for KOPEN, using the results from the third column of table 2.

As anticipated by the Mundell-Fleming framework, figure 6 shows that the trade-off between monetary autonomy and exchange rate stability has indeed grown with increasing international capital mobility. At low levels of KOPEN (0–5), the marginal effect of domestic monetary autonomy on external currency variability was not statistically different from zero with greater than 95

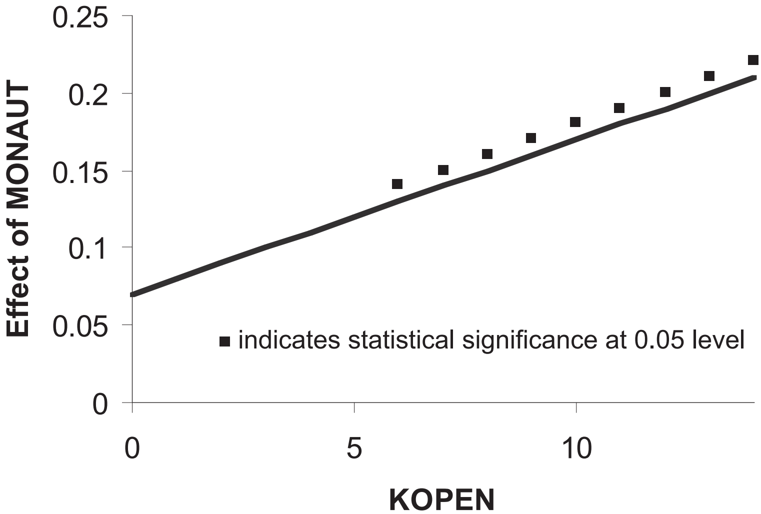

Fig. 6. The Marginal Effect of Monetary Autonomy (MONAUT) on Exchange Rate Variability (EXRCV)

percent confidence. But when KOPEN ≥ 6, monetary independence has a strong substantive and statistical effect on exchange rate variability. Looking back at figure 5, the average OECD economy began the post–Bretton Woods era with a KOPEN value of 9. Thus, the trade-off between domestic monetary autonomy and exchange rate stability has been quite strong throughout the period under study, and it appears reasonable to treat the international capital mobility constraint largely as a given after 1973, at least for the OECD countries.

Because I argued earlier that de jure commitments (either unilateral or multilateral) to fix the value of the national currency should not be treated as a strong proxy for actual exchange rate stability, it becomes useful to provide some additional evidence on this point. In the fourth column of table 2, I added three dummy variables for different OECD exchange rate commitments in the post–Bretton Woods era. EMS is coded as 1 if country *i* was a member of the exchange rate mechanism of the EMS in year *t*; otherwise, it is coded as 0. SNAKE is coded as 1 if country *i* was a member of the European Snake in year *t*; otherwise, it is coded as 0. Finally, UNIPEG is coded as 1 if country *i* made a unilateral declaration to peg its currency for year *t*; otherwise, it is coded as 0. If these de jure commitments have really produced a more stable national currency, their coefficients should be negatively signed and statistically significant.

The results show that while each of the new variables take on the expected negative coefficient, all three fall well short of statistical significance. It is perhaps not surprising that SNAKE and UNIPEG were not associated with strong reductions in national currency variability, given the well-documented weakness of the European Snake regime[22] and the inherent flexibility associated with unilateral decisions to peg the national currency. But the statistically weak EMS result may surprise some readers. It is certainly possible that the EMS coefficient was pushed toward zero due to collinearity with the MONAUT terms, following the logic that EMS membership reduced domestic monetary independence and, thus, that any EMS effect would be diluted in the presence of the monetary autonomy indicator. To explore this possibility, I dropped MONAUT and its interaction term in the fifth column of table 2. But even in this more restricted model, the estimated EMS effect in reducing national currency variability remains weak, a result that is consistent with Marston's conclusion (1995, 135) that the EMS "has fallen somewhat short of its objectives" and "not managed to stabilize [the] exchange rates" of member states.

In response to this evidence, one might argue, with good reason, that the EMS result would have been stronger had I focused more narrowly on national exchange rate variability versus the German mark, effectively the EMS anchor currency.[23] But it is important to remember that the German mark's value is reflected in the SDR benchmark, as is the French franc, the second largest EMS currency. As some economists have argued, "the decisive criterion" for judging exchange rate stability should be "whether the EMS has reduced the variability of the *global average,* or effective, exchange rates of the currencies participating in the ERM" (Gros and Thygesen 1992, 105; emphasis added). The results presented here, much like those offered earlier by Vaubel (1989), demonstrate that when using an appropriately broad measure of exchange rate stability, it becomes much harder to find any strong EMS effects.

To summarize briefly before proceeding to look at the extent of domestic monetary autonomy after 1973, this empirical exercise has illustrated two important points. First, the operational measures that will be used to capture both monetary policy autonomy and exchange rate instability have the essential property that is expected by the Mundell-Fleming framework: larger absolute interest rate differentials are associated with greater national currency variability when controlling for and interacted with international capital mobility. This demonstration shows how these operational measures pass a

22. On this point, see Gros and Thygesen 1992; Ungerer 1997; McNamara 1998.

23. Indeed, Frieden (2002, 853) and I (Bearce 2003, 406) reported that membership in the European Snake and the EMS was significantly associated with less currency variability relative to the German mark.

very important construct validity test. Second, the empirical results also show that we cannot capture exchange rate stability and related monetary policy choices simply by looking at whether or not a government has made a political commitment to fix the value of its national currency. It may well be the case that OECD governments, especially those in Western Europe, are increasingly making such commitments, but this fact cannot be treated as strong evidence of either greater exchange rate stability or the corresponding loss of domestic policy autonomy.

3. Monetary Policy Divergence after 1973

Having presented operational measures for both domestic monetary autonomy and exchange rate variability (the first step of the study in this chapter) and having then demonstrated their validity using a test from the Mundell-Fleming framework (the second step), we can now assess the extent of external monetary policy convergence (or divergence) for the OECD countries in the post–Bretton Woods era (the crucial third step). The time-series descriptive data for one of the two external monetary policy convergence indicators—exchange rate stability—was presented in figure 4. These data showed no real trend toward greater exchange rate stability, or reduced currency variability, for OECD governments after 1973, a finding that runs contrary to the theoretical expectations of the monetary convergence hypothesis. Similar descriptive data for the other operational indicator—domestic monetary autonomy as measured by the average nominal interest rate differential—can be presented to assess the trend (or lack thereof) toward external monetary convergence, or smaller interest rate differentials, after 1973.

But before looking at these data, it is useful to think carefully about how a pattern of monetary policy convergence would present itself. Inasmuch as the OECD countries are thought to have held substantial domestic monetary autonomy at the beginning of the post–Bretton Woods era and then to have increasingly lost it after 1973 (see figs. 2–3 in chap. 2), the systematic monetary policy convergence hypothesis suggests that the average OECD nominal interest rate differential should show a strong trend toward zero over time, as illustrated in figure 7. If there is only a weak trend toward zero, this might be consistent with episodic, but not necessarily systematic, monetary policy convergence. To the extent that average OECD nominal interest differential is growing for part or all of the post–Bretton Woods era, the dominant trend would be toward greater domestic monetary autonomy, despite its apparent costs with international capital mobility.

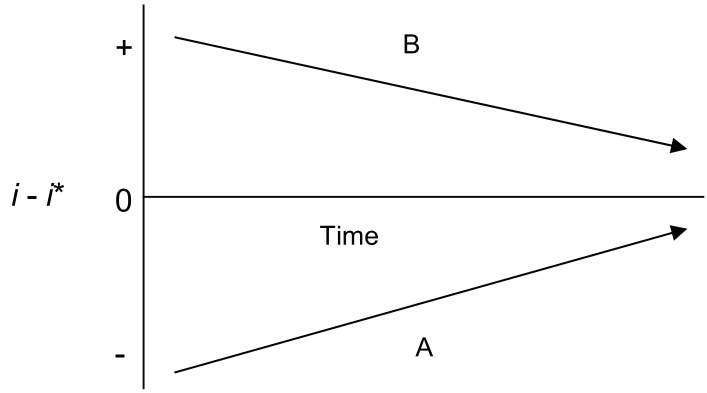

Fig. 7. The Hypothesized Trend toward Systematic Monetary Policy Convergence

Figure 7 shows two different trend lines consistent with the monetary policy convergence hypothesis. The first possibility is that OECD governments asserted domestic monetary autonomy during the Bretton Woods system in the form of negative interest rate differentials ($i < i^*$) and then raised national interest rates after 1973 to minimize their interest rate differential, as illustrated by path A. It is important to note that external monetary convergence would also be consistent with the trend illustrated by path B, where OECD governments formerly held positive interest rate differentials ($i > i^*$) and then reduced national interest rates toward the low prevailing external interest rate.

I can find no statement in the monetary convergence literature describing the direction in which national interest rates are expected to move in order to achieve external monetary policy convergence. Instead, systematic monetary convergence has been expressed in terms of economic outcomes, such as stable exchange rates and low inflation, as discussed in chapter 2. This suggests an important lack of theoretical development, at least in terms of what these economic outcomes mean for national interest rates. For example, should national interest rates be rising to counter inflationary expectations, or should they be falling consistent with the achievement of lower inflation? Similarly, should national interest rates rise or fall to achieve greater exchange rate stability? Thus far, the political science scholarship on monetary policy convergence has not addressed these important questions. But to be generous, it should be possible to accept the hypothesis of systematic monetary policy convergence if the data fall along either path A or path B.

To be even more generous to the hypothesis of systematic monetary policy convergence, the data in figure 8 show the average OECD nominal interest rate differential over time after excluding the country with the largest interest rate differential in each year.[24] This exclusion has the effect of pushing the average OECD interest rate differential toward zero, potentially biasing the results in favor of systematic monetary policy convergence. But since I cannot control for the different factors that may affect the variation in OECD national interest rates with simple descriptive statistics, this exclusion helps avoid the situation of an outlier country exerting undue influence on the OECD sample.[25] Despite this favorable setup, figure 8 clearly shows that the average OECD nominal interest rate differential corresponds to neither of the two possible paths toward systematic monetary policy convergence for most of the post–Bretton Woods era.

After looking at these data, three important points should be noted and discussed. First, these data suggest that OECD governments, on average, began the post–Bretton Woods era with a relatively convergent monetary policy stance (nominal interest rate differentials close to zero), revealing the loss of domestic monetary autonomy at the end of the Bretton Woods system. While perhaps surprising to scholars who have viewed the Bretton Woods system as one where national governments held substantial domestic monetary independence, this finding is quite consistent with data presented by Quinn and Inclan (1997), showing that most OECD governments had opened their national capital markets well before the end of the Bretton Woods system (on this point, see also fig. 5). Thus, in its final years, the Bretton Woods system became marked by a surprisingly high degree of international capital mobility. This fact, coupled with the Bretton Woods fixed exchange rate regime, made domestic monetary autonomy somewhat difficult to achieve before the system ended in the early 1970s (see Gowa 1983).[26]

24. For most years, this country is Turkey, the lowest income OECD member state.

25. In the statistical models where OECD national interest rates are the dependent variable, I control for these factors by including gross domestic product per capita and country-specific fixed effects as independent variables. Thus, I model the important differences among this set of countries, rather than excluding particular OECD member states.

26. Indeed, the loss of domestic monetary autonomy toward the end of the Bretton Woods system helps explain why many OECD governments acquiesced in ending the system's fixed exchange rate regime. They could not forestall growing international capital mobility, and they wanted to regain the domestic policy independence that had been effectively lost in the late 1960s and early 1970s. As Webb (1991, 311) wrote, the "fixed exchange rate system was abandoned in the early 1970s, when increasing capital mobility made it impossible for governments to stabilize exchange rates without subordinating monetary policy to that end."

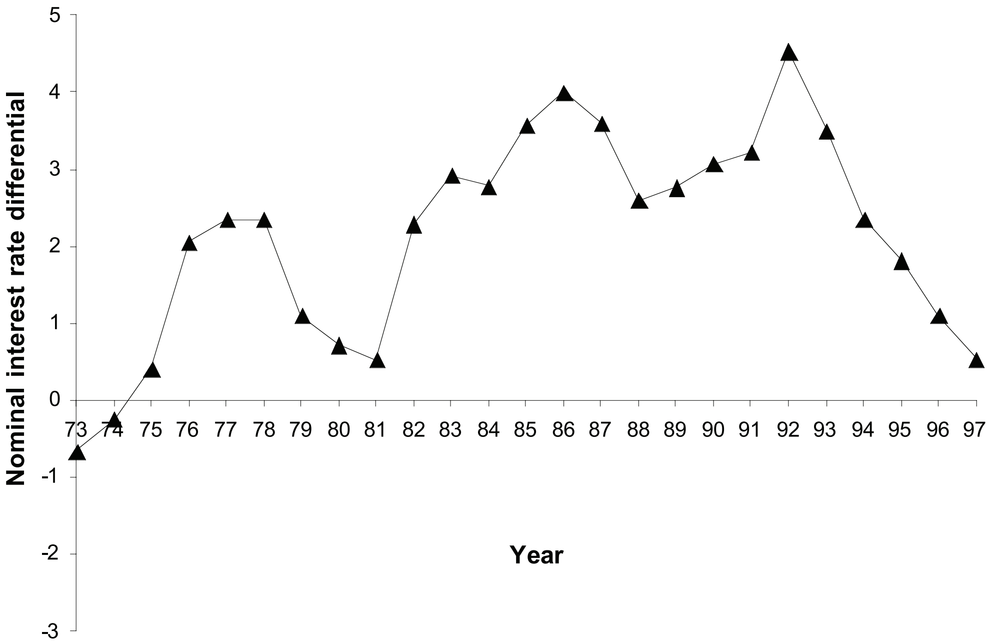

Fig. 8. Average OECD Nominal Interest Rate Differential, 1973–97. (Monetary policy data from International Monetary Fund, *International Financial Statistics.*)

Second, and more important for the systematic monetary convergence hypothesis, the data show no strong trend toward external monetary convergence, or smaller interest rate differentials, over this twenty-five-year period, except after 1994. As was discussed in chapter 2, it is not particularly hard to explain how external monetary convergence was possible in the late 1990s, since much of the global North experienced a brief period of noninflationary growth, where societal demands for domestic policy independence effectively lessened—even disappeared (see Gobbin and Van Aarle 2001; Von Hagen and Strauch 2001). That there is not even a weak trend toward smaller nominal interest rate differentials in figure 8 for most of the post–Bretton Woods era is consistent with the hypothesis of OECD monetary policy divergence after 1973.

Additional support for OECD monetary policy divergence after 1973 can be seen in figure 9, which plots the variation around the yearly interest rate differential average using a standard deviation measure of variability. If the advanced industrial democracies were really converging on any particular interest rate

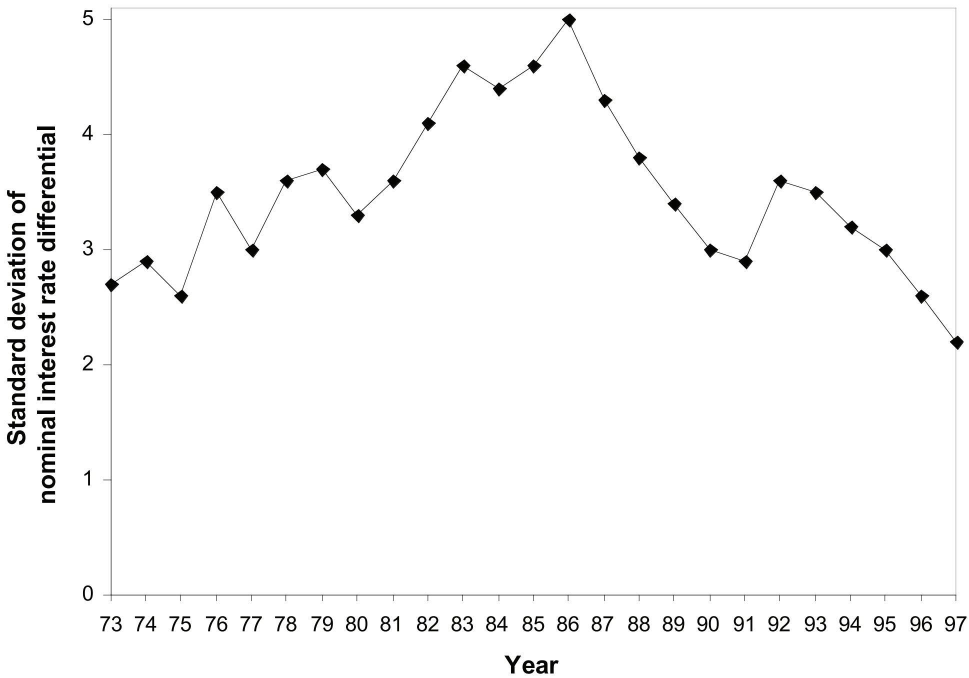

Fig. 9. Variation in OECD Monetary Autonomy, 1973–97

differential outcome (either positive or negative), we should expect to see a strong trend of declining variability over time. At the very most, there is only a very weak trend, limited to the 1990s.[27] Even during the 1990s, the variation measure remains well above zero, suggesting OECD monetary policy divergence even during a period when external monetary policy convergence was relatively easy to achieve.

Third, and most important for the analysis to come in chapter 4, the data shown in figure 8 evidences that domestic monetary policy autonomy in the post–Bretton Woods era has been largely characterized by national interest rates that are higher on a nominal basis than the world interest rate. This fact

27. If I include all OECD member states without dropping the country with the largest interest rate differential, there is actually a slight trend toward greater variation over time. This finding accords with Froot and Rogoff's conclusion (1991, 271) that "the degree of monetary-policy convergence is generally overstated" even for Western Europe, the most favorable region for the monetary convergence hypothesis.

suggests an important international capital mobility constraint on domestic policy choices. If national governments engage in behavior that is viewed as potentially inflationary by international investors, they will have to raise national interest rates for greater domestic price stability. But this international capital mobility constraint has certainly not led to any systematic monetary policy convergence. Just the opposite appears to be the case; many OECD governments have been willing to accept domestic monetary independence in the form of positive nominal interest rate differentials.

This fact may strike some readers as surprising, especially those who have conceived of domestic monetary policy autonomy exclusively in terms of holding negative nominal interest rate differentials. Indeed, if we look at monetary policy in complete isolation, then domestic monetary independence in the form of positive interest rate differentials would be quite perplexing. But as I argued in chapters 1 and 2, divorcing monetary policy choices from those of fiscal policy is a mistake. We should instead consider how governments might coordinate their fiscal and monetary policy instruments in an effort to achieve multiple economic policy goals given the constraints imposed by international capital mobility in the post–Bretton Woods era. It may be the case that when governments engage in fiscal expansion to promote economic growth, they must also raise interest rates for domestic price stability. In this sense, domestic monetary independence would be directly related to fiscal policy expansion and autonomy. Indeed, when placed in this broader policy mix context, domestic monetary autonomy in the form of positive national interest rate differentials becomes more comprehensible. This is the important subject to which chapter 4 is devoted.

But before proceeding to chapter 4, with its explanation for domestic monetary policy autonomy in the form of positive nominal interest rate differentials, it is useful to conclude this chapter with a brief consideration of why the "world" interest rate—as defined by the weighted average of the G-5 economies—has been and can be expected to remain relatively low, at least on a nominal basis. First, consider the fact that most of the world's capital has been created within these five largest and most developed capitalist economies and that there is a distinct home bias with regard to investment decisions (see Schulze and Ursprung 1999, 345). Consequently, even with international capital mobility, much of the world's capital remained concentrated in these national economies, making the local supply of money more generous relative to the demand. Hence, it is not surprising to observe a lower nominal interest rate, reflecting the cheaper price of capital, in the more developed national economies.

Second, it is important to consider, as was discussed earlier, that nominal interest rates are also an indicator of national inflation rates and inflationary expectations. To the extent that larger and more developed capitalist economies are likely to have more producers competing on the basis of price considerations, it may be easier for them to keep prices stable and, therefore, to keep nominal interest rates low.[28] Together, these considerations help explain why the so-called world interest rate in the post–Bretton Woods era has been relatively low on a nominal basis. Consequently, external monetary convergence required most OECD governments to achieve the domestic economic conditions that would allow them to lower national interest rates. Certainly, this should have been easier for more developed capitalist economies for the two reasons already mentioned. Thus, when we model national interest rates and related domestic policy choices, it will be important to control for variation in economic development among the different OECD economies across time and space.

But this is not the only factor explaining national interest rates, and for political scientists, it may not even be the most interesting one. Chapter 4 will enrich the story by considering how the fiscal policy decisions made by OECD governments affect national interest rates and how these governments effectively coordinate their fiscal and monetary policy instruments to achieve both economic growth and lower inflation given the external constraints imposed by international capital mobility. In doing so, it will provide a broader context for understanding macroeconomic policy divergence in the post–Bretton Woods era.

28. On this point, my data set shows a statistically significant negative correlation for both gross domestic product and gross domestic product per capita with inflation.