



LUND UNIVERSITY

A Return to the Convertibility Principle? Monetary and Fiscal Regimes in Historical Perspective. The International Evidence

Jonung, Lars; Bordo, Michael D.

Published in:
Monetary theory and policy experience

2001

Document Version:
Publisher's PDF, also known as Version of record

[Link to publication](#)

Citation for published version (APA):

Jonung, L., & Bordo, M. D. (2001). A Return to the Convertibility Principle? Monetary and Fiscal Regimes in Historical Perspective. The International Evidence. In A. Leijonhufvud (Ed.), *Monetary theory and policy experience* (Vol. conference volume No. 132, pp. 225-290). (IEA conference volume series). Palgrave Macmillan.

Total number of authors:
2

General rights

Unless other specific re-use rights are stated the following general rights apply:
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Read more about Creative commons licenses: <https://creativecommons.org/licenses/>

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

LUND UNIVERSITY

PO Box 117
221 00 Lund
+46 46-222 00 00

8

A Return to the Convertibility Principle? Monetary and Fiscal Regimes in Historical Perspective: The International Evidence*

Michael D. Bordo

Rutgers University, New Brunswick and NBER, USA

and

Lars Jonung

Stockholm School of Economics, Sweden

1 Policy regimes

The stabilization policy doctrines that emerged after the Second World War II combined two elements: monetary and fiscal policies. In this study we shall focus on the long-run relationship between these two types of policy. As long run patterns are considered, our study is based on the regime concept. It is prominent in several empirical studies of monetary history: see, for example, Bordo (1993a, 1993b), Bordo and Jonung (1996, 1997), and Bordo and Schwartz (1999).

We define a regime as a set of arrangements and institutions accompanied by a set of expectations – expectations by the public with respect to policymakers' actions, and expectations by policymakers about the public's reaction to their actions.¹ The behaviour of the monetary authorities is crucial

*We owe a great debt to all who have helped us to compile data. We would like to thank Erik Buyst, Marc Flandreau, Jesper Hansson, Pontus Hansson, Pierre-Cyrille Hautcoeur, Riita Hjerppe, Jong Woo Kim, Jan-Tore Klovland, Albrecht Ritschl, Roland Uittenbogaard and Vera Zamagni for support in finding data. Albrecht Ritschl has generously helped us to contact European researchers on public finances. Pontus Hansson has assisted us in the gathering and interpretation of data. We owe deep thanks to Jesper Hansson for his excellent statistical work in organizing the data, constructing the tables and drawing the figures. We appreciate comments from Tamim Bayoumi, Giorgio Fodor, Dale Henderson, David Laidler, Axel Leijonhufvud, Robert Lucas, Jacques Méhitz, Robert Mundell, Kurt Schuler and Stefano Zamagni.

to the performance of the monetary regime, just as the behaviour of the fiscal authorities (that is, the government or Ministry of Finance) determines the performance of the fiscal regime. The monetary and fiscal regimes jointly determine the prevailing stabilization policy regime. The monetary and fiscal regime are linked. The monetary regime is influenced by the rules governing the fiscal regime, and vice versa. The evolution of this interaction since the beginning of the twentieth century is the theme of this study.

In the present macrotheoretical framework, the private sector, assuming rational expectations, makes forecasts and decisions based on its understanding of the policymakers' underlying model and likely policies consistent with that model. Monetary and fiscal policymakers in turn make their forecasts and decisions based on how they expect the private sector to react. Under such a regime, the private sector's response to expansionary monetary and fiscal policies will differ dramatically in two possible scenarios: (i) if the monetary and fiscal process is constrained by adherence to the rule of a fixed price of gold under the gold standard, or to a rule restricting the growth rate of the money supply to the long-run growth rate of the economy; or (ii) if price expectations are based on guessing the monetary and fiscal authorities' actions in a discretionary regime aimed at stabilizing, for example, the rate of unemployment at less than the natural rate – see Leijonhufvud (1984) and Bordo and Jonung (1996).

Stabilization policy regimes thus encompass the constraints or limits imposed by expectations, customs, and the institutional framework, including the constitution and the political system, on the ability of the monetary and fiscal authorities to influence the evolution of macroeconomic aggregates. These constraints, determining the policy regime, are the key to understanding the dynamic behaviour of nominal variables such as the price level, interest rates and exchange rates as well as policy variables such as the money stock/monetary base and government expenditure and revenues (the budget deficit), and thus ultimately the stock of national debt. They are also important for interpreting the short-run volatility of real income and other real variables such as the rate of unemployment. The nature of the policy regime helps us to understand how monetary and fiscal policy actions impinge on the economy under 'normal' peacetime circumstances as well as how extraordinary historical economic disturbances arise, such as periods of high inflation during and following the First and Second World Wars, the Great Depression of the 1930s and the Great Inflation of the 1970s.

Two types of monetary regime have existed in history, one based on convertibility into specie (that is, on an ultimate source of liquidity not

under the discretionary control of the monetary authorities), and the other based on fiat.² The former prevailed in various guises until US President Richard Nixon closed the gold window in August 1971, thereby terminating the gold convertibility feature of the Bretton Woods international monetary system. The latter, a paper standard, where the supply of money is under the control of the monetary authorities, is the norm today. Under a fiat money regime, nations can choose either fixed or floating rates. Macroeconomic behaviour during fiat monetary standards may be closely related to the conduct of fiscal policies – for example, in the case of wartime inflationary finance or in some emerging countries at the time of writing.

Monetary policy regimes have both a domestic (national) and an international aspect. The domestic aspect pertains to the monetary arrangements that determine the domestic money supply. The international aspect relates to the monetary arrangements between nations. There is generally, a close relationship between the domestic and international aspects.

In the design of policy regimes, the choice of a nominal anchor is crucial. A nominal anchor is a nominal variable that serves as a target for monetary and fiscal policy. Under specie-convertible regimes, the rule fixing the currency-price of specie (gold and/or silver coin) is the nominal anchor. Such a standard ensures that price levels will return to some mean value over long periods of time, provided that the relative price of specie remains constant. A regime with a nominal anchor can be distinguished from one with no nominal anchor, where the monetary and fiscal authorities may, for example, use the inflation tax to meet fiscal needs, and where inflation can rise indefinitely. Inflation targeting has been accepted by several central banks in the 1990s. This implies the adoption of a moving nominal anchor, treating the inherited past as bygones. In this regime, although the inflation rate is anchored, the price level will rise indefinitely (Flood and Mussa (1994)).³

Two types of fiscal policy regime have prevailed in history. Of the first type are regimes based on fiscal or budgetary outcomes that have not influenced the money supply process through monetization of public debt. Here, the monetary regime dominates the fiscal regime. Even under these circumstances, however, the government may run budget deficits for extended periods of time as long as the public perceives that it will service its debt in the future without resort to borrowing from the central bank.⁴ The second type comprises regimes based on inflationary finance, where the monetary authorities monetize budget deficits.⁵ Historically, the attempts by governments to finance war efforts by borrowing from

central banks have been a major source of inflationary finance. In this case, the fiscal regime dominates the monetary regime. The money supply is determined by fiscal policies. In times of peace, budget deficits have been covered by taxation and borrowing from capital markets, where the borrowing has been backed by expected future budget surpluses.⁶ Since the early 1970s, deficit finance has become a regular feature in many OECD countries during peacetime conditions. This new pattern emerged after the breakdown of the last remnants of the gold standard embodied in the Bretton Woods system.

2 Rules versus discretion in policy regimes

The discussion of alternative monetary and fiscal regimes relates closely to the modern literature on rules versus discretion and the time inconsistency of government policies (Kydland and Prescott (1977)). In the simplest sense, government policy is said to be time inconsistent when a policy plan, calculated as optimal based on the government's objectives and expected to hold indefinitely into the future, is subsequently revised.

Discretion, in this context, means setting policy sequentially. The government is assumed to have an incentive to adopt policies that are different from the optimal plan, once market agents incorporate presumptive government actions rationally into their decisions. The usual example of time inconsistency in monetary policy is surprise inflation produced by the monetary authorities in attempting to reduce unemployment. A time-inconsistent fiscal policy would be to impose a capital levy or to default on the debt, once the public has purchased it. According to this approach, the government would benefit from having access to a commitment mechanism to keep it from changing planned future policy.

Alternative monetary and fiscal regimes can be classified as following rules or discretion. The convertible metallic monetary regimes that prevailed into the twentieth century were based on a rule – adherence to the fixed price of specie. The rule served as a commitment mechanism for governments to pursue monetary and fiscal policies that could otherwise be time inconsistent. This commitment mechanism was present in both the domestic and the international aspects of the regime. As an international regime, the key rule was maintenance of specie convertibility at the established par. Maintenance of the fixed price of specie by its adherents ensured fixed exchange rates. Adherence to fixed exchange rates in turn ensured that all countries would observe time-consistent domestic fiscal policy rules.

The specie standard convertible rule (with its implicit constraints on inflationary public finance) was also a contingent rule, or a rule with an escape clause. Under the contingent rule, specie convertibility could be suspended and the monetary authorities could issue inconvertible paper currency in the event of a well-understood, exogenously created crisis or emergency, such as a war, on the understanding that after the emergency had passed, convertibility would be restored, most probably at the original parity. Market agents would regard successful adherence as evidence of a credible commitment and would allow the authorities access to seigniorage (inflation tax) and bond finance at favourable terms (Bordo and Kydland (1996)).

Inconvertible regimes can also be based on monetary and fiscal rules if the authorities devise and commit to them credibly. At the domestic level, monetary rules setting the growth rates of monetary aggregates or those targeting the price level can be time consistent. Similarly, budgetary rules or norms such as maintaining a balanced budget, either on an annual basis or over the business cycle, can be time consistent.

At the international level, fixed exchange-rate regimes such as the EMS, based on a set of well-understood intervention principles and the leadership of a country dedicated to maintaining the nominal anchor, can in principle also be time consistent. The Stability Pact for the EMU should be viewed as a substitute for other mechanisms making domestic fiscal policies consistent over time with a monetary regime based on a common European currency, that is on permanently fixed exchange rates.

3 Macroeconomic performance of monetary and fiscal regimes: the international experience

Next we survey the historical experience of monetary and fiscal regimes from the late nineteenth century to the end of the twentieth. We cover both international and domestic (national) aspects of the prevailing policy regimes. As a background to our historical survey, we present evidence on key measures of economic performance since 1881 for fourteen industrialized countries (the USA, UK, Germany, France, Japan, Canada, Italy, Belgium, the Netherlands, Switzerland, Sweden, Denmark, Finland and Norway).

The comparisons are based on annual data. We group the data according to the following chronology of the international monetary regimes from the 1870s onwards: the classical gold standard (1881–1913), the First World War (1914–19), the inter-war period (1920–38), the Second World War (1939–46), the Bretton Woods regime split into two

subperiods: preconvertible Bretton Woods period (1947–58), the convertible Bretton Woods period (1959–71), and the present regime of floating rates between the principal currencies. This last regime is split into two subperiods: 1973–82 (high inflation); and 1983–95 (low inflation). The break in 1982 signifies dramatically changing monetary and fiscal policies among the major economies.

One important caveat is that the historical regimes presented here do not always represent clear examples of fixed and floating rate regimes, or of convertibility-rule-based and inconvertible discretion regimes. In particular, the inter-war period is composed of three regimes: general floating from 1920 to 1925; the gold exchange standard from 1926 to 1931; and a managed float for major countries until the outbreak of the Second World War. The Bretton Woods regime cannot be characterized as a fixed-exchange-rate regime throughout its history: the pre-convertibility period was close to the adjustable peg envisioned by its architects; the convertible period was close to a *de facto* fixed dollar standard.

Finally, although the period since 1973 has been characterized as a floating exchange rate regime, at various times it has experienced varying degrees of management. Major countries have allowed their currencies to float against each other, while minor countries have tended to tie their currencies to a foreign currency. Moreover, the period can be subdivided into two subperiods: a period of high inflation for a number of major countries freed from the 'convertibility principle'; and a period of low inflation with a seeming return to it.⁷

In studying the evolution of monetary policies, we focus on the monetary base and the money stock as our measures of the conduct of the monetary authorities.⁸ The monetary base is our measure of seigniorage as well.⁹ To describe the conduct of fiscal policy, we examine a number of fiscal indicators: the growth of nominal central government debt, and central government budget deficits as a percentage of national income as well as the ratio of national debt to national income.¹⁰ These measures reflect the conduct of stabilization policies.¹¹ We also consider government expenditure as a share of national income to be a structural measure.

To gain an impression of the impact on the economy of monetary and fiscal policies we also examine the rate of inflation, long-term nominal interest rates, exchange rates and real per capita growth. Tables 8.1 to 8.11 present descriptive statistics on the macro variables for each of the fourteen countries, where available, while Figures 8.1 to 8.11 display the averages of these macro variables for all the countries in our sample. The data for each variable are converted to a continuous annual series from 1880 to 1995. The definition of the variable used (for example, M1 versus

M2) is dictated by the availability of data over the entire period as shown in the Data Appendix on pages 266–77. In some cases we do not have data for the first few years of the period. If more than half of the observations for a period are missing, we do not report any statistics. For each variable and each country we present two summary statistics: the mean and standard deviation. The Data Appendix describes the construction of the data used. For the G7 countries and for all the countries taken as a group, we show two summary statistics: the grand mean and a simple measure of convergence defined as the standard deviation of each country's summary statistic around the grand means of the group of countries.

Next, we discuss the behaviour of measures of monetary and fiscal policy and other macro aggregates under shifting historical regimes.

3.1 The classical gold standard 1881–1913

The world switched from bimetallism to gold monometallism in the 1870s. Many nations wished to emulate the example of Britain, the world's leading commercial and industrial power. When Germany used the Franco-Prussian War indemnity to finance the creation of a gold standard, other prominent European nations followed. Sweden, Denmark and Norway went jointly on to gold as part of the Scandinavian monetary union established in the 1870s. By 1880, most countries were on gold.¹²

Until 1914, the international monetary regime based on the convertibility principle of the gold standard served as the basic defining framework for national policy regimes. The currencies of most countries were defined *de jure* and *de facto* in terms of a fixed weight of gold. The fixed nominal price of gold served as nominal anchor to national monetary systems, and via fixed exchange rates to the international monetary system. Within this period, the use of national monetary and fiscal policies for peacetime domestic objectives were subordinated to the maintenance of gold convertibility.

3.1.1 *Monetary policy*

The convertibility requirement of the gold standard provided an effective constraint on monetary policy. This is demonstrated in Table 8.1, and Figure 8.1 showing growth rates for the monetary base, and Table 8.2 and Figure 8.2 for the money stock for different monetary regimes. Base and money stock growth was at a low and stable level during the period 1881–1913. The base, and ultimately the money supply, was determined by the monetary gold stock under the gold standard and new gold production was limited (by increasing costs) relative to the existing stock. Also, under

Table 8.1 Descriptive statistics on the rate of monetary base growth under different monetary regimes, 14 countries, 1881–1995 (annual data: mean and standard deviation)

	Gold Standard		First World		Inter-war		Second World		Bretton Woods		Floating exchange		Post-war									
	war		war		war		war		Preconvertible		High Inflation		Low Inflation									
	1881–1913	1914–1919	1920–1938	1939–1946	1947–1971	1947–1958	1959–1971	1973–1995	1973–1982	1983–1995	1973–1982	1983–1995	1973–1982	1983–1995	1947–1995							
USA	4.2	5.2	8.2	8.0	2.3	7.9	21.5	11.8	2.5	7.1	0.4	9.4	4.4	3.1	7.2	2.8	7.0	2.2	7.4	3.2	4.7	5.8
UK	0.2	2.0	41.2	21.8	1.0	4.8	13.9	6.6	3.6	4.2	2.6	4.1	4.5	4.2	7.9	9.6	9.6	9.7	6.5	9.7	5.9	7.8
Germany	3.0	3.9	62.3	24.9	6.8	14.9	35.0	11.9	9.9	5.5	11.5	3.2	8.6	6.6	5.3	5.0	4.6	5.5	5.8	4.8	8.0	6.3
France	2.8	3.4	36.0	16.2	6.0	6.5	31.1	7.8	10.4	7.0	13.4	8.0	7.6	4.6	4.4	9.5	7.2	11.0	2.3	8.0	8.0	9.3
Japan	3.4	8.8	27.2	21.6	2.6	8.5	64.0	59.0	20.6	25.9	24.5	37.4	17.0	5.4	8.2	7.4	10.9	9.36.1	4.9	14.9	20.1	
Canada	4.8	7.8	12.3	10.1	-0.2	6.9	21.6	12.6	5.1	3.7	3.9	3.4	6.3	3.6	6.5	5.1	10.4	4.6	3.6	3.1	6.0	4.6
Italy	1.6	4.3	38.0	13.1	1.9	17.0	52.3	36.3	15.3	17.7	16.8	18.1	13.9	17.9	12.0	10.5	19.2	8.36.4	8.5	13.7	14.5	
Belgium	3.6	2.7	38.6	63.1	8.7	9.4	33.9	24.0	4.2	3.0	4.2	3.4	4.1	2.7	3.2	4.2	5.6	3.6	1.4	3.8	3.9	3.9
Netherlands	1.5	3.8	22.9	16.8	-0.2	7.1	41.4	27.9	5.4	4.4	4.9	5.6	5.7	3.1	6.9	8.5	7.7	2.96.3	11.2	6.2	6.6	
Switzerland	4.1	9.7	23.1	17.8	3.4	12.9	11.3	5.1	6.5	5.1	4.1	3.8	8.6	5.3	1.4	6.9	3.4	6.8–0.1	6.9	4.1	6.5	
Sweden	6.0	10.0	22.7	19.1	2.1	7.5	13.6	9.7	5.8	4.2	5.5	5.8	6.1	2.3	12.0	15.0	12.4	14.3	11.6	16.2	8.8	11.1
Denmark	2.4	4.1	22.1	12.8	-0.3	7.5	22.1	12.0	4.6	8.9	2.6	9.7	6.3	8.1	13.6	35.1	7.5	12.9	18.2	45.6	8.8	25.0
Finland	3.1	10.4	50.1	35.3	4.0	10.8	38.1	24.1	8.2	7.0	9.9	7.6	6.6	6.3	17.5	19.1	18.2	18.0	16.9	20.6	12.7	14.6
Norway	3.3	5.3	27.9	16.7	0.6	8.2			5.1	6.4	4.1	8.9	6.1	2.6	7.2	5.4	9.9	5.0	5.2	5.0	6.1	5.9
G7 mean	2.5	4.4	28.2	14.5	2.5	8.3	29.9	18.3	8.4	8.9	9.1	10.5	7.8	5.7	6.4	6.2	8.6	6.3	4.8	5.3	7.7	8.5
G7 convergence	1.7	2.9	20.5	8.4	2.6	5.4	20.6	19.5	7.0	8.6	8.9	12.2	5.5	5.3	3.4	3.7	5.6	3.9	2.6	3.3	4.8	6.2
Total mean	2.9	5.4	28.8	19.8	2.6	8.7	28.5	17.8	7.1	7.3	7.2	8.6	7.1	5.1	7.6	9.6	8.9	7.6	6.5	10.1	7.5	9.5
Total convergence	1.6	3.2	16.1	14.4	2.8	4.1	17.2	15.5	5.2	6.4	6.8	9.0	4.0	4.1	4.7	8.5	5.1	5.0	5.4	11.2	4.0	6.6

Note: Banknote circulation 1881–1948, M0 1949–95; Germany excluded 1920–4; Denmark, France and Netherlands excluded 1945; Belgium excluded 1944; Convergence is defined as the standard deviation of each country's summary statistic around the grand mean of the group of countries.
Sources: See Data Appendix.

Table 8.2 Descriptive statistics on the rate of money stock growth under different monetary regimes, 14 countries, 1881–1995 (annual data: mean and standard deviation)

	Gold Standard		First World		Inter-war		Second World		Bretton Woods		Floating exchange		Post-war									
	war		war		war		war		Preconvertible		High Inflation		Low Inflation									
	1881–1913	1914–1919	1920–1938	1939–1946	1947–1971	1947–1958	1959–1971	1973–1995	1973–1982	1983–1995	1947–1995	Mean	S.D.	Mean	S.D.							
USA	6.5	5.0	2.3	8.3	15.2	6.1	5.2	2.8	3.2	1.8	7.1	2.1	7.4	3.8	9.7	2.5	5.6	3.7	6.4	3.5		
UK	2.2	2.0	1.1	4.4	12.0	3.9	4.0	4.9	2.0	5.4	5.8	3.8	13.3	6.3	15.3	6.6	11.860	8.9	7.8			
Germany	5.7	4.9	4.5 10.3		14.8	6.7	19.1	6.8	11.8	4.9	7.6	4.9	7.4	3.4	7.6	2.6	7.2	4.0	10.9	6.4		
France	2.7	3.9	27.6	13.6	6.4	9.1	27.2	10.3	14.8	5.5	16.0	7.1	13.7	3.5	14.4	3.6	4.4	4.4	12.0	6.7		
Japan	6.3	15.9	25.6	15.7	2.9	10.5	59.0	45.8	23.2	23.3	29.0	32.4	17.8	7.6	9.1	5.5	5.9	3.7	15.8	18.6		
Canada	7.5	5.7	10.4	6.5	1.5	4.7	12.8	4.6	7.1	4.1	5.5	3.1	8.6	4.5	11.3	6.0	5.3	7.6	3.5	9.2	5.5	
Italy	3.3	3.2	26.7	13.3	4.6	6.6	38.8	16.2	16.6	9.7	19.8	13.4	13.6	2.3	12.8	6.8	6.5	8.5	3.1	14.9	8.5	
Belgium	3.1	5.2	6.5 11.3		4.7	3.5	3.1	3.7	6.1	2.9	5.3	3.8	5.9	4.3	4.9	3.5	4.9	3.5	5.2	3.8		
Netherlands	1.8	3.5	27.5	12.6	0.0	8.1	22.7	39.0	6.2	5.2	3.5	6.0	8.7	2.8	7.3	5.0	7.7	6.870	3.1	6.9	5.3	
Switzerland	4.2	4.2	10.8	4.2	3.2	4.7	6.1	2.8	7.6	3.4	4.9	1.8	10.1	2.3	5.9	5.7	6.4	7.8	5.5	3.6	6.8	4.6
Sweden	5.7	3.8	20.7	11.7	-0.3	4.9	8.3	4.3	7.6	3.7	6.5	3.3	8.5	4.0	8.0	4.9	11.5	4.0	5.3	3.8	7.9	4.3
Denmark	4.9	4.7	21.6	13.0	-0.7	4.5	11.8	7.5	7.0	4.7	3.9	3.7	9.9	3.6	10.1	8.4	12.0	5.6	8.6	10.0	8.6	6.8
Finland	7.2	6.6	33.8	23.0	5.7	6.4	21.3	10.2	12.0	4.8	12.7	6.2	11.3	3.3	11.8	6.6	15.4	3.6	9.0	7.1	12.0	5.7
Norway	5.1	3.1	27.3	20.3	-1.9	5.4	13.8	11.6	6.7	3.6	5.0	2.7	8.4	3.7	10.6	4.7	13.0	2.4	8.7	5.2	8.6	4.5
G7 mean	4.9	5.8	19.7	9.8	3.3	7.7	27.5	14.5	12.2	8.2	13.5	10.0	11.2	4.1	9.7	5.4	12.9	4.7	7.3	4.1	11.2	8.1
G7 convergence	2.1	4.6	7.9	5.0	1.9	2.5	18.6	16.0	7.0	7.0	10.2	10.6	4.2	1.9	2.7	1.4	4.0	1.7	2.4	0.9	3.4	4.9
Total mean	4.7	5.1	21.6	11.9	2.6	7.1	20.8	13.5	9.8	6.2	9.6	6.9	10.1	3.7	9.1	5.5	11.6	4.8	7.1	4.6	9.6	6.6
Total convergence	1.9	3.3	7.8	6.1	2.7	2.5	15.1	14.1	5.6	5.2	8.3	7.9	3.3	1.4	2.6	1.4	3.9	1.821	1.9	3.2	3.8	

Notes: Germany excluded 1920–5 (missing data). Convergence is defined as the standard deviation of each country's summary statistic around the grand mean of the group of countries.

Sources: See Data Appendix.

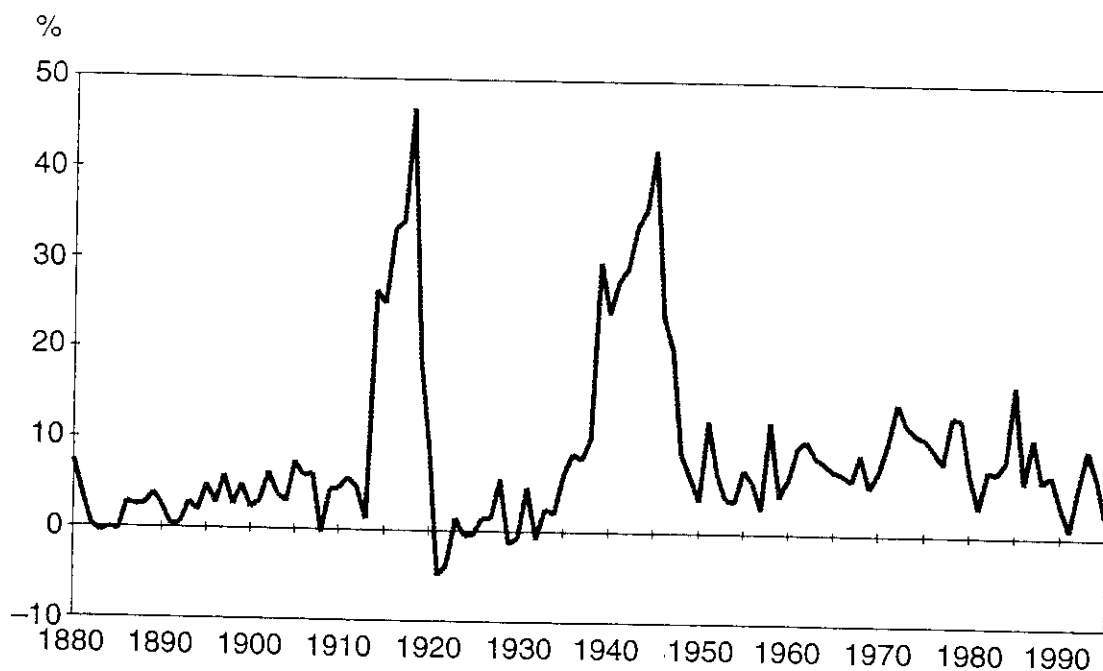


Figure 8.1 Monetary base growth 1881–1995

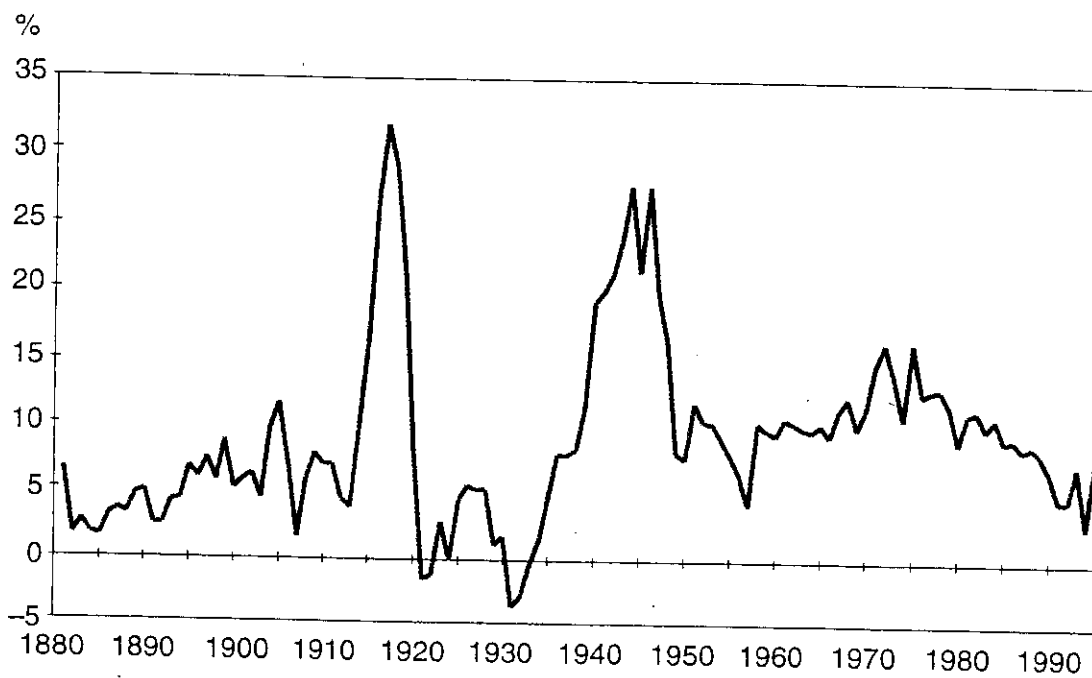


Figure 8.2 Money stock growth 1881–1995

the fixed exchange rates of the classical gold standard regime, discipline was enforced by gold and capital flows. Indeed, monetary policy could be used for domestic purposes only within the gold points that represented a target zone (Bordo and MacDonald (1997)).

3.1.2 *Fiscal policy*

The classical gold standard had important implications for fiscal policy. Under the historic convertible regime, fiscal policy was only used in wartime following the classical principle of tax smoothing – financing of wartime expenditure by borrowing, and then in peacetime servicing and amortizing the debt by taxation.¹³ In the absence of such a policy, the required changes in tax rates would reduce severely the incentives for economic activity in wartime when the need to maintain such activity was the greatest. Long-run commitment to gold convertibility at the original parity and the implied commitment by the government to redeem and service government debt at the fixed price of gold made such a policy of public finance possible.

During the classical gold standard, fiscal policy was subordinated to the convertibility rule for most countries in our sample, thus restricting the room for fiscal measures.¹⁴ Under the convertible regime, money-financed deficits would lead to a gold outflow and a speculative attack at the point when market agents anticipated that international reserves would be exhausted. Bond-financed fiscal deficits would lead to a risk premium reflecting the probability of default and the likelihood that future taxes would not be raised. The risk premium, other things being equal, would increase the balance of payments deficit, leading to gold outflows and a possible speculative attack (Bordo and Schwartz (1996)). Thus the gold standard acted as a 'good housekeeping seal of approval' to ensure that countries would follow prudent monetary and fiscal policies (Bordo and Rockoff (1996)).

From a stabilization policy point of view, the domestic economy was governed by a self-regulating mechanism. There were no periods of prolonged and persistent unemployment during the classical gold standard period compared to the interwar and post-Second World War periods. Nor did there exist the knowledge and acceptance of debt financing as part of a belief in an 'active' fiscal policy – see DeLong (1998). This is seen below in a number of measures of the stance of fiscal policy.

Central government expenditure as a share of national income remained at a fairly stable and low average level for all countries, at close to 8 per cent during the classical gold standard period (see Table 8.3 and Figure 8.3). This is the lowest level among all the regimes during the years studied. Central government budget deficits as a percentage of national income were also at the lowest level of all regimes in Table 8.4 and Figure 8.4. Central government debt as a share of national income was falling slightly prior to the First World War for the USA, UK, Canada, France and Italy. It was stable for Sweden, Norway and Finland, and rising from a low

Table 8.3 Descriptive statistics on central government expenditure as a percentage of national income under different monetary regimes, 14 countries, 1881-1995 (annual data: mean and standard deviation)

	Gold Standard				First World				Inter-war				Second World				Bretton Woods				Floating exchange				Post-war	
	war		war		war		war		1920-1938		1939-1946		1947-1971		1947-1958		1959-1971		1973-1982		1983-1995		1947-1995			
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.		
USA	2.3	0.3	7.8	9.0	5.9	2.7	26.5	16.1	17.3	1.9	16.5	2.4	18.0	1.1	21.8	1.6	20.6	1.5	22.8	0.7	19.5	2.9				
UK	7.1	1.0	44.3	15.7	17.8	1.2	51.0	12.5	28.4	2.0	27.8	2.0	29.0	1.9	38.4	2.8	37.5	2.6	39.2	2.9	33.2	5.5				
Germany	5.5	1.2	38.1	10.5	15.3	12.1			15.1	3.0	14.6	2.0	15.4	3.6	30.5	2.1	29.2	2.1	31.4	1.6	23.0	8.1				
France	11.7	1.2	43.5	14.2	19.5	4.3	35.6	10.0	22.7	2.7	22.7	3.7	22.6	1.2	41.4	4.3	37.5	3.5	44.4	1.6	31.7	10.0				
Japan	17.8	9.1	22.1	3.8	35.5	11.0	91.7	41.7	24.1	18.0	36.0	20.3	13.2	1.5	17.2	3.2	15.7	3.1	18.5	2.7	20.8	13.7				
Canada	6.4	1.2	14.3	2.6	9.7	2.4	31.8	14.2	15.8	1.4	15.8	1.3	15.8	1.5	22.5	2.1	20.7	1.4	24.0	1.0	19.0	3.7				
Italy	14.0	1.9	38.6	15.7	25.2	10.3	34.5	9.6	18.4	2.4	19.1	3.1	17.8	1.4	33.4	7.3	27.9	5.7	39.6	0.9	24.8	9.0				
Belgium					22.2	8.1	32.5	6.1	25.8	5.2	24.6	5.6	26.9	4.7	49.9	4.8	47.7	5.9	51.7	2.8	37.1	13.0				
Netherlands	8.5	0.3	17.4	4.8	15.9	3.7	59.0	26.7	26.0	4.1	27.0	5.7	25.1	1.7	52.4	4.4	49.9	5.1	54.3	2.5	38.4	13.9				
Switzerland	2.2	0.4	5.9	0.4	5.1	0.9	16.9	3.3	8.6	1.3	9.6	1.3	7.8	0.5	9.5	0.7	9.5	0.8	9.5	0.6	9.0	1.1				
Sweden	6.6	0.5	9.7	4.5	9.6	2.0	20.8	4.1	21.1	4.2	18.4	2.4	23.6	4.0	40.3	6.1	35.6	5.6	44.0	3.5	30.3	10.9				
Denmark	6.2	1.2	6.6	2.3	6.7	1.0	8.2	1.1	18.4	5.9	13.9	1.2	22.5	5.6	39.1	4.2	36.0	4.3	41.5	2.2	28.4	11.5				
Finland	9.1	2.3	14.5	4.2	16.6	1.8	41.8	11.3	21.7	2.0	22.2	2.7	21.2	1.0	31.4	5.9	27.5	2.3	34.5	6.1	26.2	6.4				
Norway	7.6	1.4	7.0	2.5	9.2	1.6	17.4	6.6	19.3	1.7	19.0	1.9	19.6	1.6	38.9	2.5	37.2	2.0	40.2	2.0	28.6	10.0				
G7 mean	8.1	2.0	26.1	8.9	16.1	5.5	38.7	14.9	17.7	3.9	19.1	4.3	16.5	1.5	25.7	2.9	23.6	2.5	27.5	1.4	21.5	6.6				
G7 convergence	6.0	2.9	17.3	6.2	11.2	4.9	27.9	12.9	8.5	5.8	10.5	6.5	8.3	1.0	13.4	2.2	12.4	1.7	14.4	1.0	10.2	4.4				
Total mean	7.5	1.6	19.3	6.4	14.2	4.2	33.4	11.7	18.9	3.7	19.2	3.7	18.6	2.1	31.1	3.5	28.8	3.1	33.1	2.1	24.7	8.0				
Total convergence	4.7	2.2	15.4	5.5	9.1	4.1	23.1	11.1	7.2	4.3	8.4	4.8	7.5	1.6	14.6	2.1	13.7	1.9	15.4	1.5	10.2	4.5				

Note: Convergence is defined as the standard deviation of each country's summary statistic around the grand mean of the group of countries.
Sources: See Data Appendix.

Table 8.4 Descriptive statistics on the central government budget deficit as a percentage of national income under different monetary regimes, 14 countries, 1881–1995, (annual data: mean and standard deviation)

	Gold Standard		First World War		Inter-war		Second World War		Bretton Woods		Floating exchange		Post-war									
	1881–1913		1914–1919		1920–1938		1939–1946		1947–1971		1973–1982		1983–1995									
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.								
USA	-0.2	0.5	5.1	7.0	1.0	2.8	15.2	13.2	0.6	1.6	0.0	1.9	1.2	1.0	3.1	1.1	5.5	1.0	2.4	2.5		
UK	-0.3	1.3	24.1	14.8	0.6	2.7	20.2	12.5	1.8	4.0	2.3	5.5	1.4	1.7	4.0	5.1	2.3	3.2	2.9	3.6		
Germany	0.5	0.4	23.5	11.8	2.7	3.3	45.3	35.4	1.0	1.8	1.8	2.7	0.5	0.5	2.4	2.0	0.7	2.7	2.0	1.7	1.8	
France	0.9	1.8	33.1	16.8	5.4	6.9			2.8	7.5	6.8	11.3	0.3	0.9	2.8	2.1	2.0	3.3	1.4	2.7	5.2	
Japan	3.3	6.8	1.3	1.6	5.0	3.9	41.1	32.1	1.9	4.2	3.0	2.7	0.8	5.1	5.4	6.4	4.5	4.2	1.7	3.3	4.3	
Canada	1.1	1.5	11.4	4.6	0.9	2.7	17.3	10.3	1.6	2.3	0.2	2.5	2.8	1.1	5.6	1.7	4.9	6.1	1.5	3.5	2.8	
Italy	1.4	1.4	28.0	16.4	3.5	6.5	24.2	8.6	4.6	5.6	6.1	7.8	3.2	1.5	11.5	1.9	10.9	12.0	1.8	7.8	5.4	
Belgium					5.4	9.5			2.5	1.4	2.2	1.6	2.8	1.1	8.9	4.3	6.8	3.7	10.5	4.1	5.6	4.4
Netherlands			7.2	2.9	1.2	3.6	50.3	82.2	0.4	8.8	-0.6	12.9	1.4	0.9	3.8	2.2	3.3	2.2	4.3	2.2	2.0	6.6
Switzerland			4.0	0.8	0.4	1.5	6.7	3.4	-0.4	1.0	-0.7	1.4	-0.1	0.5	1.3	1.4	1.5	1.6	1.2	1.3	0.5	1.5
Sweden	0.5	0.7	2.4	1.8	0.6	1.2	6.3	4.9	1.3	1.2	1.5	1.1	1.1	1.3	6.6	5.0	6.9	6.3	5.8	3.8	4.4	
Denmark	0.4	1.0	1.6	1.3	0.3	1.3	0.2	0.8	0.8	1.3	1.6	1.5	0.0	0.3	5.5	5.9	7.1	4.3	5.4	3.0	4.8	
Finland	0.4	1.1	4.4	6.2	0.6	3.3	15.7	9.6	0.9	1.5	1.0	1.7	0.8	1.3	3.8	5.4	1.4	5.5	6.7	2.2	4.1	
Norway	0.7	1.5	2.2	2.4	0.3	1.6	8.0	6.4	0.8	2.7	-0.3	3.5	1.8	1.1	3.4	4.1	4.5	3.7	4.3	2.2	3.8	
G7 mean	0.9	2.0	18.1	10.4	2.7	4.1	27.2	18.7	2.0	3.8	2.9	4.9	1.5	1.7	5.2	2.1	4.9	2.0	5.3	1.8	3.5	3.6
G7 convergence	1.2	2.2	12.1	6.1	2.0	1.8	12.8	11.8	1.3	2.2	2.7	3.5	1.1	1.5	3.0	0.8	3.1	1.2	3.2	0.6	2.0	1.4
Total mean	0.8	1.6	11.4	6.8	2.0	3.6	20.9	18.3	1.5	3.2	1.8	4.2	1.3	1.3	5.0	3.1	4.7	2.7	5.1	3.0	3.1	3.9
Total convergence	1.0	1.8	11.5	6.0	2.0	2.4	16.4	22.8	1.2	2.5	2.3	3.8	1.0	1.2	2.7	1.6	2.7	1.6	3.0	1.9	1.8	1.4

Note: The budget deficit is defined as the change in end-of-year government debt. Germany excluded 1923–4. Convergence is defined as the standard deviation of each country's summary statistic around the grand mean of the group of countries.

Sources: See Data Appendix.

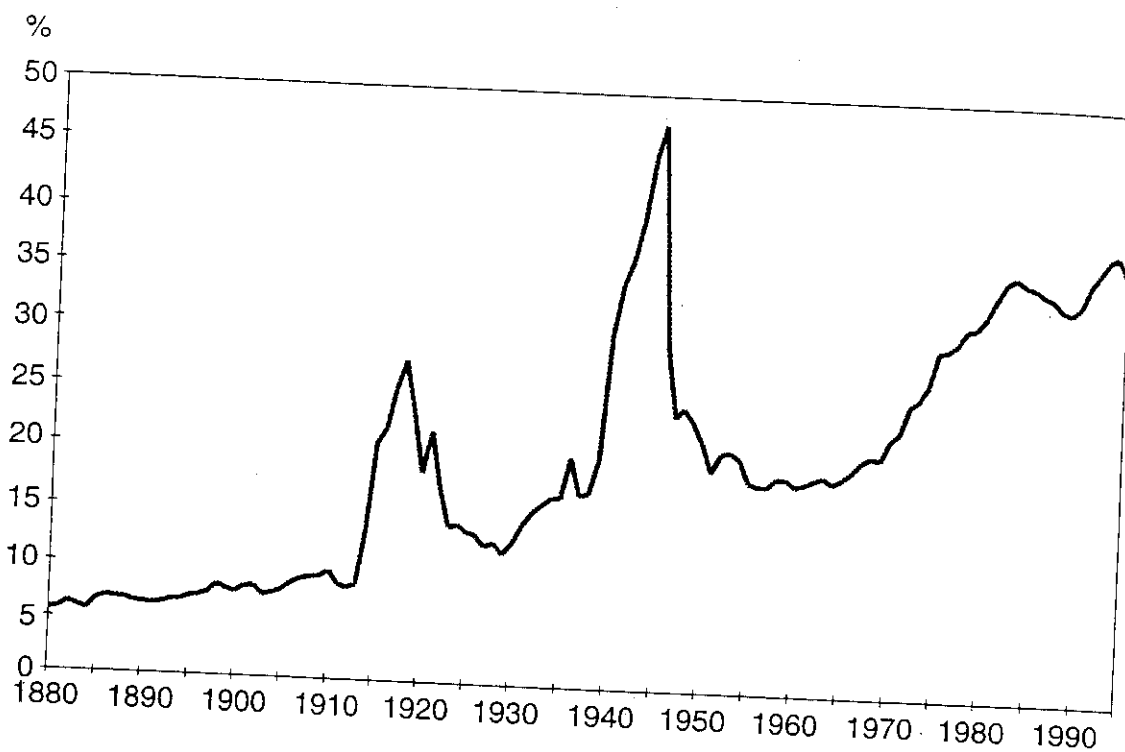


Figure 8.3 Central government expenditures as a percentage of GDP 1881–1995

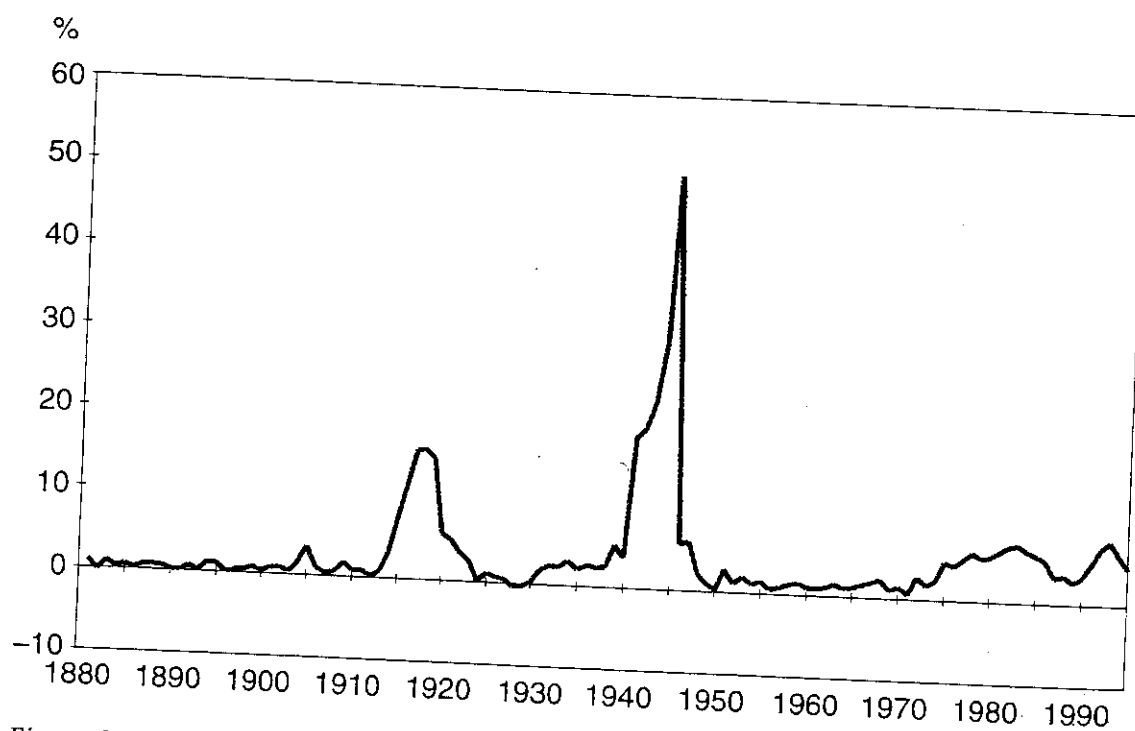


Figure 8.4 Central government budget deficit as a percentage of GDP 1881–1995

level for Germany (see Tables 8.5 and 8.6 and Figures 8.5 and 8.6). The growth of central government debt during the classical gold standard was, on average, the lowest among the monetary regimes.

Table 8.5 Descriptive statistics on the central government debt as a percentage of national income under different monetary regimes, 14 countries, 1881–1995 (annual data: mean and standard deviation)

	Gold Standard		First World War		Inter-war		Second World War		Bretton Woods		Floating exchange		Post-war									
	1881–1913		1914–1919		1920–1938		1939–1946		1947–1971		1973–1982		1947–1995									
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	High Inflation	Low Inflation	Mean	S.D.								
USA	7.6	3.8	10.0	11.2	29.4	9.5	73.6	37.0	60.9	21.4	78.7	16.4	44.4	7.4	45.3	13.0	33.5	1,154.4	10.2	53.0	19.3	
UK	38.5	8.4	72.9	41.3	162.2	12.6	161.7	47.3	125.8	50.7	168.1	39.3	86.8	16.8	43.2	4.7	45.1	2.6	41.8	5.5	85.6	54.9
Germany	6.8	3.0	56.8	32.3	16.2	12.2	146.4	136.1	8.2	1.4	8.9	1.8	7.7	0.7	19.8	7.4	13.1	4.3	24.9	4.6	14.0	7.9
France	95.6	13.5	135.2	46.0	118.2	29.1			25.0	8.7	33.9	1.0	19.6	6.4	20.7	10.3	11.2	3.9	28.17.0	22.5	9.9	
Japan	38.9	20.3	44.2	15.4	57.4	18.9	145.8	104.1	16.4	4.9	19.0	3.7	14.1	4.7	39.7	20.1	26.1	17.0	56.7	3.3	25.6	17.9
Canada	37.4	9.9	47.5	15.9	65.2	14.6	105.6	32.7	62.1	21.5	76.6	23.4	48.8	4.6	55.1	15.7	39.7	3.3	67.0	9.5	58.4	19.0
Italy	110.1	15.5	117.0	22.1	100.2	21.0	103.7	29.1	42.1	8.0	48.4	6.8	36.3	3.2	75.2	24.2	52.6	6.2	93.9	15.5	57.3	23.9
Belgium					90.1	24.6			60.5	14.8	62.2	19.9	59.0	8.3	84.7	35.6	49.6	12.2	113.9	16.0	71.3	29.0
Netherlands	51.5	4.7	59.9	11.5	204.1	149.9	71.2	56.1	111.7	58.1	33.9	6.8	42.9	6.8	42.9	18.4	23.6	6.6	57.6	6.5	56.9	44.2
Switzerland	13.2	3.8	22.3	3.2	45.1	11.9	22.3	13.4	34.5	7.6	11.0	4.4	15.1	4.4	15.1	3.7	13.3	3.7	16.6	3.1	18.7	10.6
Sweden	16.5	1.5	17.1	1.5	20.8	4.0	41.9	11.6	28.6	7.2	34.3	4.4	23.4	4.7	51.2	19.6	34.4	12.9	64.0	12.9	39.1	18.3
Denmark	18.6	3.3	13.5	0.9	20.3	3.1	11.1	1.9	12.4	4.5	15.2	3.2	9.8	3.9	47.3	26.4	21.8	19.4	66.9	5.9	28.6	25.4
Finland	12.9	1.2	12.8	6.2	15.6	5.4	53.5	18.3	15.7	7.7	20.3	8.9	11.5	2.0	18.2	18.8	7.0	3.3	26.9	21.2	16.7	13.9
Norway	19.5	4.5	14.5	3.3	31.6	6.8	44.6	22.7	27.8	7.5	31.4	9.6	24.5	2.0	34.4	6.2	38.1	5.7	30.7	4.4	30.8	7.6
G7 mean	47.8	10.6	69.1	26.3	78.4	16.8	122.8	64.4	48.7	16.6	61.9	13.2	36.8	6.3	42.7	13.6	31.6	5.5	52.4	8.0	45.2	21.8
G7 convergence	40.3	6.3	43.6	13.7	51.6	6.7	33.7	44.7	39.9	16.9	53.8	14.2	27.0	5.1	19.3	6.9	15.7	5.3	23.9	4.2	25.5	15.6
Total mean	36.6	7.7	46.6	15.7	57.8	12.6	94.8	50.2	41.4	16.3	53.1	14.6	30.8	5.4	42.3	16.0	29.27.3	53.1	9.0	41.3	21.6	
Total convergence	34.9	6.4	41.1	15.4	45.1	8.2	59.4	50.6	32.1	16.8	44.0	16.4	22.7	3.9	20.6	9.2	14.9	5.7	27.7	5.5	22.4	13.7

Note: Convergence is defined as the standard deviation of each country's summary statistic around the grand mean of the group of countries.
Sources: See Data Appendix.

Table 8.6 Descriptive statistics on the growth of nominal central government debt under different monetary regimes, 14 countries, 1881–1995 (annual data: mean and standard deviation)

	Gold Standard		First World War		Inter-war		Second World War		Bretton Woods		Floating exchange		Post-war									
	1881–1913		1914–1919		1920–1938		1939–1946		1947–1971		1973–1982		1983–1995									
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	High Inflation	Low Inflation	Mean	S.D.								
USA	-1.5	6.1	94.8	125.7	2.4	8.9	30.7	29.3	1.7	2.8	0.2	2.0	3.1	2.8	11.2	3.9	10.1	3.7	12.0	4.1	6.3	5.8
UK	-0.4	3.5	55.2	37.8	0.4	1.9	15.0	11.2	1.4	2.4	1.2	2.5	1.6	2.3	10.4	7.6	13.2	6.5	8.38	0	5.8	7.0
Germany	10.3	10.2	90.2	76.7	23.6	38.3	53.9	14.8	10.6	18.7	16.0	29.6	7.2	6.3	15.0	8.7	19.3	9.2	11.6	7.0	12.9	14.2
France	1.0	2.0	32.8	15.3	4.2	5.3			4.3	6.1	9.4	4.5	1.6	5.2	18.1	17.3	23.6	25.0	13.8	5.6	11.2	15.1
Japan	9.2	19.8	4.6	5.4	9.5	6.0	38.2	16.2	18.0	12.6	18.9	15.8	17.0	9.0	17.2	12.7	27.5	11.38	2	3.8	17.7	12.5
Canada	3.2	5.1	33.7	12.0	1.1	3.8	22.3	12.5	3.7	4.3	0.9	3.9	6.3	2.8	12.2	5.0	14.2	4.8	10.6	4.6	7.8	6.2
Italy	1.3	1.3	33.0	23.2	3.1	7.1	32.4	11.6	8.8	4.2	7.6	2.4	9.8	5.1	19.8	7.4	26.0	3.4	15.1	5.9	14.5	8.1
Belgium	8.3	10.5			5.6	10.8			4.3	2.2	3.5	2.5	4.9	1.7	12.9	5.9	15.3	5.3	11.0	5.9	8.5	6.1
Netherlands			16.1	6.1	2.0	6.0	27.2	27.6	1.5	6.7	-2.3	7.5	5.0	3.4	11.6	7.8	15.3	8.6	8.7	6.0	6.3	8.7
Switzerland			53.4	28.5	1.7	7.1	18.6	9.3	-1.0	4.0	-2.0	3.4	-0.1	4.4	10.3	11.2	13.9	13.2	7.6	9.1	5.1	11.0
Sweden	3.3	4.6	16.8	14.4	2.7	5.6	22.2	23.3	5.1	5.0	4.8	4.0	5.4	6.0	16.6	11.5	23.9	8.4	11.0	10.4	10.7	10.3
Denmark	2.4	6.0	14.4	12.4	2.5	7.6	3.0	8.5	6.9	11.0	13.4	12.6	0.8	3.6	24.0	29.5	45.6	33.1	7.3	9.2	15.1	23.1
Finland	3.5	9.7	74.4	131.0	5.7	19.5	57.4	57.4	5.9	9.8	4.4	6.4	7.3	12.2	24.8	27.4	26.0	28.2	23.8	27.8	14.5	22.1
Norway	4.1	8.2	20.5	24.6	2.0	5.9	23.2	19.2	5.0	8.5	1.4	10.0	8.3	5.2	11.2	12.3	13.6	10.8	8.8	13.8	8.8	12.6
G7 mean	3.3	6.9	49.2	42.3	6.3	10.2	32.1	15.9	6.9	7.3	7.7	8.7	6.7	4.8	14.8	8.9	19.1	9.1	11.4	5.6	10.9	9.8
G7 convergence	4.6	6.4	33.1	43.8	8.2	12.6	13.4	6.8	6.0	6.1	7.5	10.4	5.5	2.4	3.7	4.6	6.8	7.6	2.6	1.5	4.5	4.0
Total mean	3.7	7.3	41.5	39.5	4.7	9.5	28.7	20.1	5.4	7.0	5.5	7.6	5.6	5.0	15.4	12.0	20.5	12.2	11.3	8.7	10.4	11.6
Total convergence	3.7	5.0	29.8	43.6	5.9	9.2	15.5	13.6	4.7	4.7	6.7	7.6	4.4	2.8	4.9	7.8	9.2	9.5	4.3	6.2	4.0	5.5

Notes: Germany excluded 1923–24. Convergence is defined as the standard deviation of each country's summary statistic around the grand mean of the group of countries.

Sources: See Data Appendix.

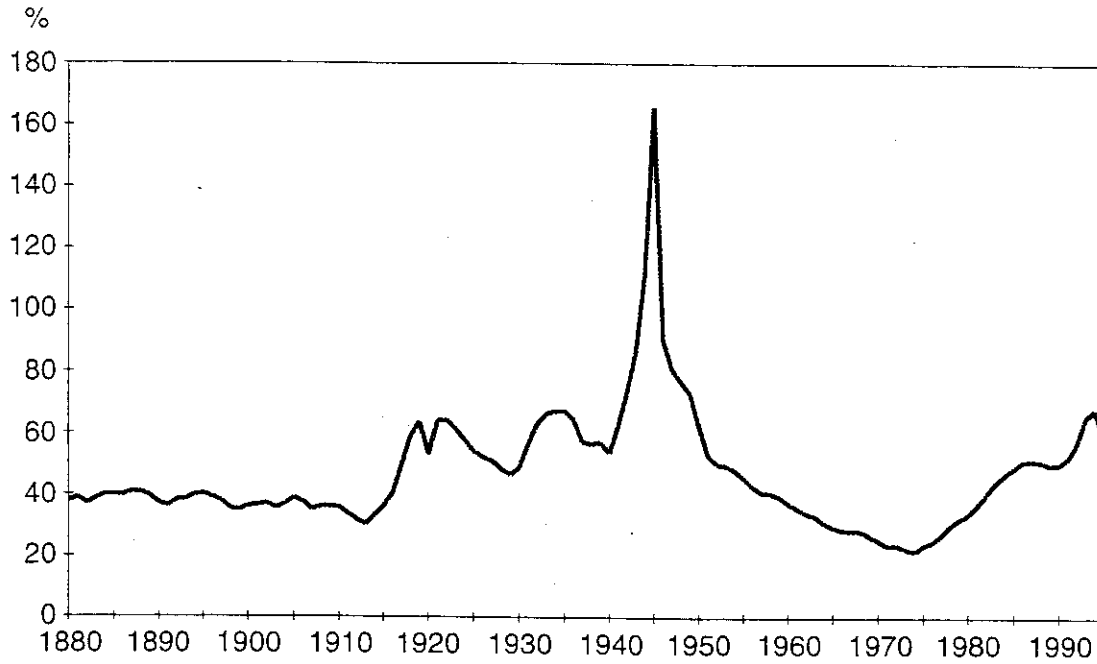


Figure 8.5 Central government debt as a percentage of GDP 1880-1995

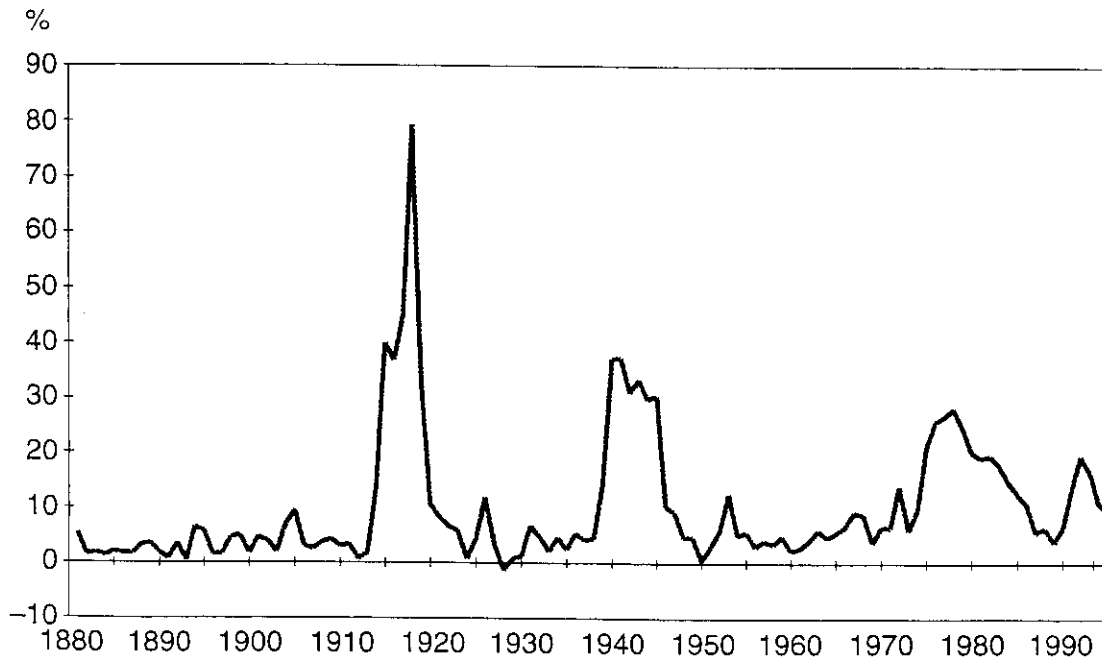


Figure 8.6 Growth of nominal central government debt 1881-1995

The growth in debt in several countries reflected a conscious attempt by governments to finance investments in infrastructure. Much of public debt accumulation in peripheral countries in the Old and New Worlds (for example, in the Nordic countries, Canada and Australia) occurred in the form of foreign borrowing from the capital markets in the UK, France and

Germany.¹⁵ The decline in US and UK debt ratios in Table 8.6 reflects amortization of the public debt accumulated during wars.¹⁶

3.1.3 *Price level, interest rates, exchange rates and real income*

The specie-convertible regime provided a stable nominal anchor to the price level, judging from Table 8.7 and Figure 8.7. The average rate of inflation was close to zero for all the countries in our sample, very similar to the growth rate of the monetary aggregates during the classical gold standard.¹⁷

Under the gold standard, the operation of the commodity theory of money determined the monetary gold stock. According to that theory, market forces would tend to cause the price level to revert towards its mean level in the face of shocks to the demand for, and supply of, gold. The process would take many years to achieve, however, so that short-term price level stability was the exception rather than the rule (Klein (1975)). Contemporary economists such as Irving Fisher, Alfred Marshall and Knut Wicksell were concerned about this, and made proposals to improve upon the workings of the gold standard (Laidler (1991)). The gold standard thus seemed to anchor price level expectations.

Long-term interest rates were lower under the gold standard than under regimes that followed in the twentieth century. Also, long-term interest rates showed the highest degree of convergence of the means during the

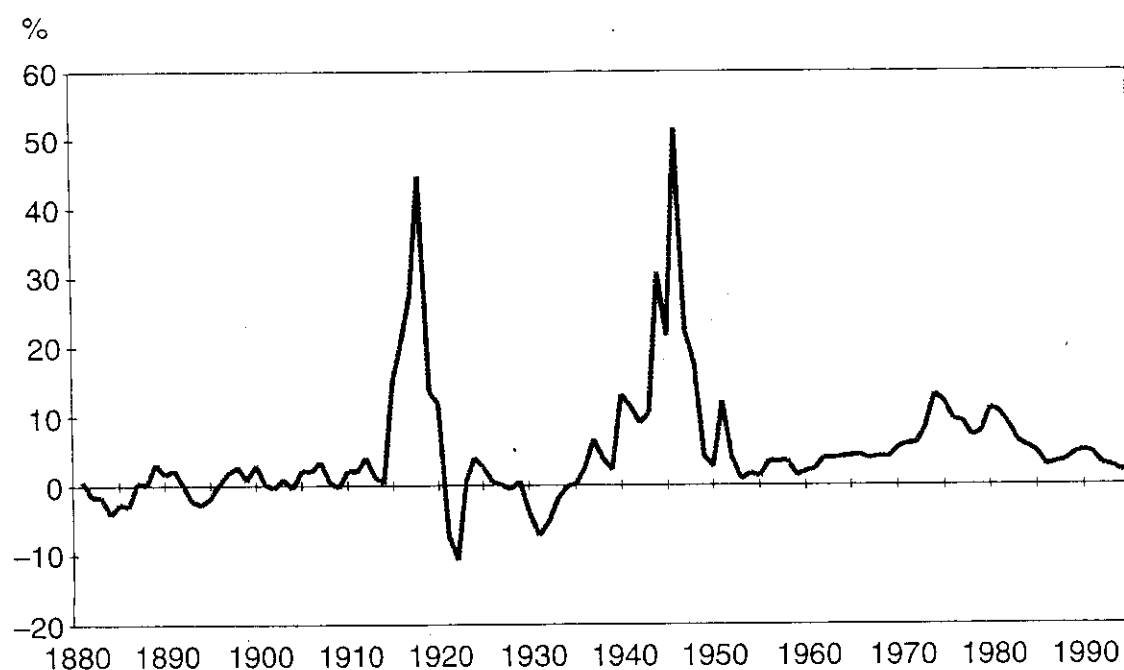


Figure 8.7 Inflation 1881-1995

Table 8.7 Descriptive statistics on the rate of inflation under different monetary regimes, 14 countries, 1881–1995 (annual data: mean and standard deviation)

	Gold Standard		First World War		Inter-war		Second World War		Bretton Woods		Floating exchange		Post-war								
	1881–1913		1914–1919		1920–1938		1939–1946		1947–1971		1973–1982		1947–1995								
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	High Inflation	Low Inflation	Mean	S.D.							
USA	0.1	2.1	9.9	7.7	-0.9	6.0	4.2	4.1	3.0	3.3	3.5	4.5	2.6	1.8	8.8	2.7	3.6	1.0	4.4	3.5	
UK	-0.1	2.5	13.5	8.1	-1.5	6.7	5.6	4.1	4.1	2.4	4.2	2.5	4.0	2.3	8.9	14.2	5.0	4.82.1	6.4	5.0	
Germany	0.9	2.4	31.5	18.9	-0.2	4.9	4.6	7.4	2.3	2.8	1.9	4.0	2.6	1.1	3.7	5.2	1.4	2.5	1.5	3.0	2.5
France	0.1	1.3	17.9	9.6	6.0	13.9	26.2	15.9	9.3	14.3	14.7	19.6	4.3	1.4	7.0	11.1	2.1	3.8	2.4	8.1	10.6
Japan	2.4	5.4	24.7	22.6	-3.4	9.5	76.3	177.1	13.1	27.0	21.6	37.8	5.3	1.9	4.7	8.7	6.01.5	1.1	9.0	19.9	
Canada	0.7	3.9	8.7	6.8	-1.1	6.1	2.5	2.3	3.3	3.4	4.2	4.7	2.5	1.3	6.3	9.6	1.7	3.71.7	4.7	3.7	
Italy	0.1	2.2	19.1	18.8	3.0	10.2	72.4	114.5	5.8	12.1	8.2	17.4	3.6	2.1	10.9	16.3	3.2	6.8	3.0	8.2	9.7
Belgium	0.2	5.0			3.4	10.7		2.8	3.5	2.8	4.9	2.8	1.4	5.3	3.4	2.9	3.2	2.0	4.0	3.6	
Netherlands	-0.2	3.6	10.2	7.4	-2.0	5.1	8.0	7.4	4.3	2.9	4.6	3.7	4.1	2.2	4.2	7.1	2.12.0	1.3	4.3	3.0	
Switzerland	0.8	1.6	14.6	9.5	-2.4	5.3	5.5	5.8	2.4	2.0	1.6	2.0	3.1	1.7	3.8	4.9	3.1	2.9	1.6	3.1	2.4
Sweden	0.4	3.2	18.4	13.0	-2.4	5.7	4.6	5.7	4.2	3.2	4.3	4.2	4.1	2.0	7.7	10.0	2.1	5.9	2.8	5.9	3.6
Denmark	0.2	3.7	15.0	6.0	-1.0	8.1	6.1	8.7	4.5	2.7	3.7	3.0	5.2	2.3	6.8	10.8	1.9	3.6	1.8	5.6	3.5
Finland	0.6	4.8	63.0	94.9	0.9	6.7	22.0	18.9	7.5	8.8	10.5	11.9	4.7	2.7	7.7	12.1	3.4	4.4	2.4	7.6	7.0
Norway	0.6	3.3	17.7	14.0	-1.8	8.1	6.1	6.9	4.1	4.0	4.1	5.3	4.1	2.5	6.9	9.6	2.5	4.9	2.5	5.5	3.9
G7 mean	0.6	2.8	17.9	13.2	0.3	8.2	27.4	46.5	5.8	9.3	8.3	12.9	3.6	1.7	6.7	10.6	3.2	3.8	1.8	6.3	7.8
G7 convergence	0.9	1.4	8.2	6.6	3.2	3.2	33.1	70.3	4.0	9.2	7.2	13.0	1.0	0.4	2.5	3.7	1.7	1.7	0.7	2.3	6.2
Total mean	0.5	3.2	20.3	18.3	-0.2	7.6	18.8	29.1	5.0	6.6	6.4	9.0	3.8	1.9	6.4	9.7	2.93.8	1.9	5.7	5.8	
Total convergence	0.7	1.3	14.2	23.6	2.7	2.6	25.7	53.5	3.0	7.0	5.6	10.0	0.9	0.5	2.0	3.1	1.3	1.4	0.6	1.9	4.8

Notes: Germany excluded 1920–4. Convergence is defined as the standard deviation of each country's summary statistic around the grand mean of the group of countries.

Sources: See Data Appendix.

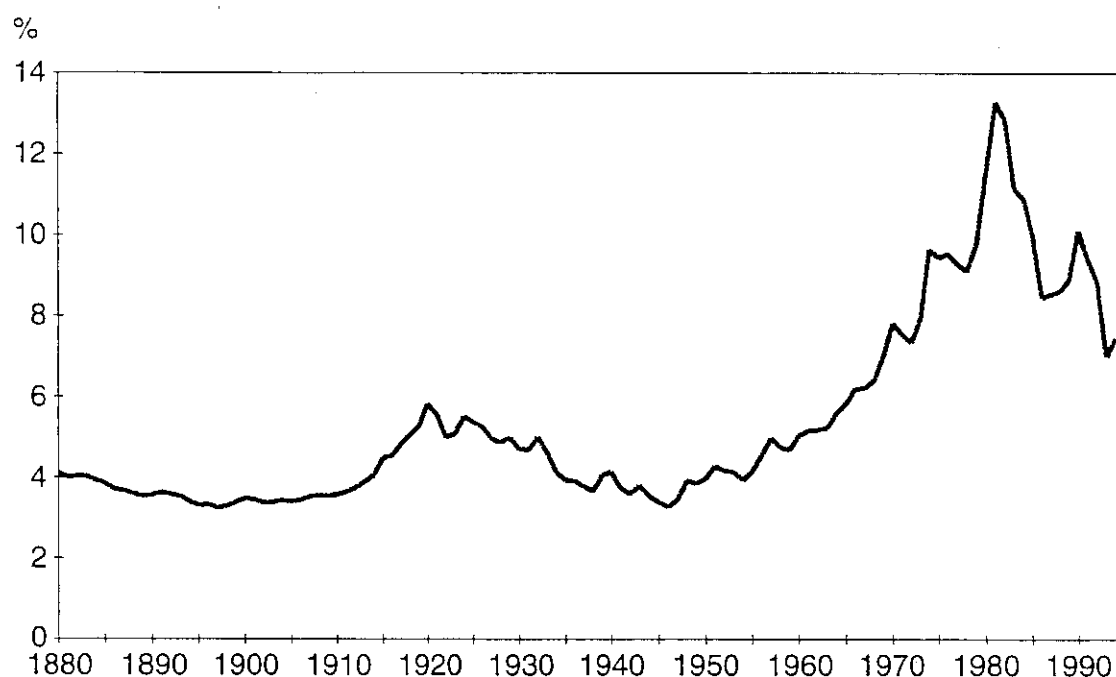


Figure 8.8 Long-term interest rate 1880–1995

classical gold standard (see Table 8.8). These findings are similar to those of McKinnon (1988), who views them as evidence of capital market integration under fixed exchange rates. Convergence of standard deviations is also highest in the gold standard period.

Exchange rate movements were small during the classical gold standard as most countries adhered to gold; Japan and Italy were exceptions in Table 8.9.

Real per capita income growth was between 1 per cent and 2 per cent – a fairly low number compared with the growth performance of the post-Second World War regimes (see Table 8.10 and Figure 8.10). Growth was also more variable across countries under the gold standard.

To sum up, there was a common norm shared by most countries guiding the conduct of monetary and fiscal policy during the reign of the classical gold standard. The gold convertibility requirement underpinned monetary and fiscal policies. This model guaranteed stable nominal performance during this period. It also implied that short-run movements in domestic economic activity was an outcome of the adherence to fixed rates and the self-regulating mechanism of the system.

3.2 The First World War

The classical gold standard ended with the outbreak of the First World War in 1914. By the eve of the war, the gold standard had evolved *de facto*

Table 8.8 Descriptive statistics on the long-term interest rate under different monetary regimes, 14 countries, 1881–1995 (annual data: mean and standard deviation)

	Gold Standard		First World		Inter-war		Second World		Bretton Woods		Floating exchange		Post-war										
	War		War		War		War		Preconvertible		High Inflation		Low Inflation										
	1881–1913	1914–1919	1920–1938	1939–1946	1947–1958	1959–1971	1973–1995	1973–1982	1983–1995	1947–1995	Mean	S.D.	Mean	S.D.									
USA	3.8	0.3	4.3	0.3	4.2	0.6	2.6	0.1	4.1	1.4	3.0	0.4	5.2	1.2	9.0	2.1	9.7	2.3	8.5	1.9	6.5	3.0	
UK	2.9	0.2	4.2	0.5	4.1	0.7	3.1	0.3	5.5	1.8	4.0	0.7	6.8	1.4	11.2	2.2	13.4	1.3	9.6	1.1	8.2	3.5	
Germany	3.7	0.2	5.3	0.5	6.8	1.7			6.4	0.8	5.9	0.5	6.8	0.8	7.9	1.4	8.7	1.5	7.2	1.1	7.2	1.4	
France	3.2	0.3	4.6	0.5	4.6	0.9	3.3	0.4	5.7	0.9	5.6	0.7	5.9	1.1	10.1	2.4	11.0	2.8	9.42.0	7.8	2.8		
Japan																							
Canada	3.5	0.4	4.6	0.7	4.5	0.9	3.0	0.2	4.7	1.6	3.3	0.5	5.9	1.0	10.2	2.0	10.5	2.6	9.91.4	7.3	3.3		
Italy	4.2	0.5	4.8	0.7	5.9	0.6	6.2	0.9	6.1	0.7	6.4	0.4	5.8	0.8	12.9	3.5	13.8	4.5	12.22.3	9.3	4.2		
Belgium	3.2	0.2			4.7	0.8	4.2	0.3	5.4	1.1	4.5	0.2	6.2	1.0	9.4	2.0	10.0	2.3	9.0	1.6	7.3	2.5	
Netherlands	3.2	0.3	4.2	0.5	4.0	0.7	3.3	0.4	4.4	1.4	3.4	0.4	5.4	1.3	8.2	1.4	9.2	1.2	7.5	1.0	6.3	2.3	
Switzerland	3.7	0.3	5.0	0.6	4.7	0.9	3.4	0.3	3.5	0.9	3.0	0.3	4.0	0.9	4.9	1.0	5.0	1.2	4.9	0.9	4.2	1.2	
Sweden	3.8	0.3	4.3	0.3	4.2	0.8	3.4	0.4	4.7	1.5	3.4	0.5	5.9	1.0	10.7	1.7	10.2	2.1	11.11.4	7.6	3.4		
Denmark	3.7	0.2	4.9	0.3	4.9	0.6	4.2	0.5	6.3	1.9	5.0	0.7	7.6	1.8	12.4	3.6	15.3	2.9	10.22.2	9.3	4.1		
Finland													7.9	0.6	10.1	1.5	9.9	0.9	10.3	1.8	9.4	1.6	
Norway	4.0	0.3	5.8	0.7	5.0	0.7	3.5	1.0	4.2	1.1	3.4	0.9	4.9	0.6	9.9	2.6	8.8	2.4	10.72.6	6.9	3.4		
G7 mean	3.5	0.3	4.6	0.5	5.0	0.9	3.7	0.4	5.4	1.2	4.7	0.5	6.1	1.1	9.7	2.2	10.7	2.3	8.91.6	7.6	2.8		
G7 convergence	0.5	0.1	0.4	0.2	1.1	0.4	1.5	0.3	0.9	0.5	1.4	0.1	0.6	0.2	2.1	0.6	2.2	1.2	2.2	0.5	1.0	1.0	
Total mean	3.6	0.3	4.7	0.5	4.8	0.8	3.7	0.4	5.1	1.3	4.2	0.5	6.0	1.0	9.5	2.1	10.2	2.1	9.0	1.6	7.4	2.7	
Total convergence	0.4	0.1	0.5	0.1	0.8	0.3	1.0	0.3	0.9	0.4	1.2	0.2	1.1	0.3	2.2	0.7	2.6	1.02.1	0.5	1.4	1.0		

Note: Convergence is defined as the standard deviation of each country's summary statistic around the grand mean of the group of countries. Sources: See Data Appendix.

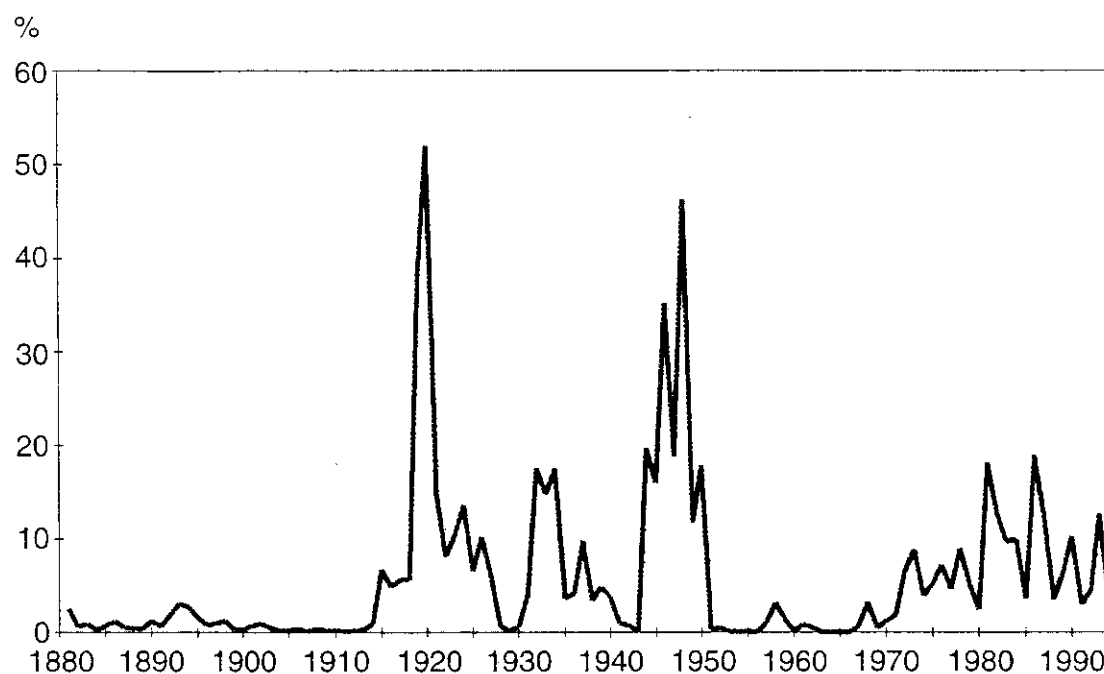


Figure 8.9 Exchange rate volatility 1881–1995

into a gold exchange standard. In addition to substituting fiduciary national monies for gold to economize on scarce gold reserves, many countries also held convertible foreign exchange, mainly deposits in London. Thus the system had evolved into a massive pyramid of credit built up on a relatively shrinking base of gold. The possibility of a crisis of confidence, causing a breakdown of the system, increased as the gold reserves of the centre diminished in relative terms. The advent of the First World War triggered such a collapse as the belligerents scrambled to convert their outstanding claims on foreigners into gold.

3.2.1 *Fiscal policy*

The main force producing the end of the gold standard, after the initial crisis of confidence at the outbreak of the war, was the unprecedentedly rapid rise in government expenditure and a concomitant rise in budget deficits caused by the war effort (see Tables 8.3 and 8.4, and Figures 8.3 and 8.4). Government expenditure as a percentage of national income trebled for the G7 countries, from 8 per cent to 24 per cent, while remaining practically constant for countries that stayed outside the war, such as Denmark, Norway and Sweden (see Table 8.3).

Governments facing this sharp rise in expenditure had a choice between raising taxes, increasing borrowing from the public, or borrowing from the central bank. Belligerent nations relied on all these methods of

Table 8.9 Descriptive statistics on exchange rate volatility under different monetary regimes, 14 countries, 1881–1995 (annual data: mean and standard deviation.)

	Gold Standard		First World		Inter-war		Second World		Bretton Woods		Floating exchange		Post-war									
	War		War		War		War		Preconvertible		High Inflation		Low Inflation									
	1881–1913	Mean S.D.	1914–1919	Mean S.D.	1920–1938	Mean S.D.	1939–1946	Mean S.D.	1947–1971	Mean S.D.	1973–1982	Mean S.D.	1983–1995	Mean S.D.	1947–1995							
USA																						
UK	0.2	0.2	2.1	3.0	6.9	8.5	2.5	4.7	2.4	7.2	3.4	9.6	1.4	4.1	8.7	6.0	9.7	6.6	8.0	5.7	5.3	7.3
Germany	0.2	0.1	47.6	88.9	25.5	57.2	0.1	0.1	3.1	8.3	5.0	11.6	1.4	2.3	8.9	7.0	8.9	7.2	8.8	7.1	5.9	8.1
France	0.3	0.2	12.6	21.5	18.4	19.8	21.9	46.8	8.9	31.8	16.0	45.6	2.3	5.1	10.0	7.3	10.9	8.4	9.3	6.6	9.4	23.1
Japan	3.0	4.8	1.2	0.7	7.5	10.8	24.7	42.7	25.0	79.9	51.9	111.4	0.2	0.7	8.2	6.9	7.4	6.5	8.8	7.4	16.9	57.3
Canada	0.0	0.0	0.8	1.2	2.6	3.4	1.5	2.1	2.2	2.3	2.9	2.6	1.5	1.9	3.6	2.4	3.4	2.5	3.82	2.9	2.4	
Italy	1.4	1.5	9.2	5.5	16.4	31.9	52.4	84.9	5.4	18.0	11.1	25.3	0.2	0.3	10.1	9.9	10.6	11.8	9.7	8.6	7.6	14.6
Belgium	2.7	3.1	12.5	10.3	12.7	15.4	5.8	14.3	0.6	2.1	1.1	3.0	0.1	0.5	9.7	7.6	9.9	9.0	9.5	6.8	5.1	7.1
Netherlands			6.0	8.0	5.6	7.9	5.6	14.4	1.9	6.1	3.3	8.7	0.6	1.3	8.9	6.8	8.7	6.9	9.17	5.3	7.3	
Switzerland			7.4	7.0	6.4	9.4	0.6	0.8	0.3	1.1	0.1	0.5	0.4	1.5	9.6	7.5	9.7	8.1	9.5	7.4	4.8	7.0
Sweden	0.2	0.2	9.3	11.0	6.9	10.2	0.8	1.7	2.3	8.4	4.8	11.8	0.1	0.3	8.8	8.7	7.5	8.0	9.89	4	5.5	9.0
Denmark	0.2	0.1	8.2	11.4	10.6	12.8	3.5	3.6	2.3	6.9	4.0	9.6	0.7	2.2	9.1	7.0	8.9	7.9	9.2	6.6	5.6	7.6
Finland			19.2	27.5	15.7	28.2	19.1	35.8	5.5	10.6	8.9	13.3	2.3	6.2	8.9	6.5	6.0	4.6	11.2	7.0	7.0	8.9
Norway			7.7	9.6	12.4	13.4	3.5	4.6	1.9	6.3	3.9	8.8	0.1	0.3	7.4	4.8	6.5	5.2	8.0	4.5	4.6	6.1
G7 mean	0.7	1.0	10.5	17.3	11.0	18.8	14.7	25.9	6.7	21.1	12.9	29.4	1.0	2.1	7.1	5.6	7.3	6.2	6.9	5.4	6.9	16.1
G7 convergence	1.1	1.8	17.0	32.5	9.3	20.0	19.7	33.1	8.6	28.1	18.0	39.4	0.9	2.0	3.8	3.3	4.1	3.9	3.6	3.1	5.4	19.7
Total mean	0.8	1.0	10.3	14.7	10.6	16.3	10.1	18.3	4.4	13.5	8.3	18.7	0.8	1.9	8.0	6.3	7.7	6.6	8.2	6.2	6.1	11.8
Total convergence	1.1	1.7	12.0	22.7	6.8	14.6	14.8	25.2	6.4	20.8	13.3	29.1	0.8	2.0	2.8	2.5	3.0	2.9	2.9	2.4	3.8	14.1

Note: Absolute rate of change; Germany excluded 1922–3. Convergence is defined as the standard deviation of each country's summary statistic around the grand mean of the group of countries.

Sources: See Data Appendix.

Table 8.10 Descriptive statistics on real per capita income growth under different monetary regimes, 14 countries, 1881–1995 (annual data: mean and standard deviation)

	Gold Standard		First World War		Inter-war		Second World War		Bretton Woods		Floating exchange		Post-war									
	1881–1913		1914–1919		1920–1938		1939–1946		1947–1971		1973–1982		1983–1995									
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.								
USA	1.5	5.0	1.1	8.6	0.5	8.1	5.5	10.3	1.9	2.8	1.3	3.6	2.4	1.7	1.4	2.2	0.9	2.8	1.8	1.7	1.7	2.5
UK	0.9	3.0	0.3	5.1	0.8	4.3	1.5	6.4	2.1	1.7	1.7	2.0	2.5	1.4	1.8	2.5	1.4	3.0	2.2	2.2	2.0	2.1
Germany	1.8	2.9	-8.8	2.9	5.9	12.5	-5.2	14.3	5.0	3.4	6.3	4.0	3.8	2.3	2.0	2.1	1.9	2.8	2.2	1.4	3.6	3.2
France	1.6	3.2	-2.9	14.0	2.8	6.9	0.1	23.8	4.9	2.1	5.0	2.9	4.8	1.2	1.8	1.6	2.2	1.6	1.4	1.5	3.4	2.4
Japan	1.7	3.9	5.0	3.1	2.5	6.5	-6.5	17.6	7.8	3.0	6.8	3.1	8.7	2.6	2.8	1.9	2.9	2.1	2.7	1.9	5.4	3.5
Canada	2.8	4.7	-1.0	8.7	1.0	8.2	5.9	7.9	2.6	2.6	2.0	3.3	3.1	1.7	1.8	3.0	2.3	2.9	1.4	3.2	2.2	2.8
Italy	0.9	3.9	-1.2	1.9	1.5	4.1	-1.0	25.4	5.2	2.6	5.9	3.1	4.6	2.1	2.5	2.3	3.0	3.1	2.0	1.4	3.9	2.8
Belgium					1.7	3.6			3.4	2.1	2.3	2.3	4.2	1.4	2.0	2.0	2.3	2.5	1.7	1.5	2.7	2.1
Netherlands	0.8	4.9	0.8	11.6	1.4	3.8	1.0	28.8	4.4	3.4	4.5	4.3	4.4	2.7	1.7	1.6	1.3	2.1	2.0	1.2	3.1	3.0
Switzerland	1.4	4.0					1.1	5.1	3.0	3.0	2.4	4.0	3.5	1.7	0.8	2.3	0.7	3.0	0.9	1.6	1.9	2.9
Sweden	2.2	2.2	-1.1	6.3	3.5	3.7	2.0	3.0	3.2	1.6	2.7	1.3	3.6	1.7	1.3	1.9	1.5	1.7	1.2	2.1	2.3	1.9
Denmark	1.8	1.7	0.0	7.7	2.2	3.9	2.0	19.3	3.3	2.5	2.8	2.8	3.8	2.2	1.8	2.0	1.4	2.5	2.0	1.6	2.4	2.4
Finland	1.9	3.0	-3.2	13.0	4.2	3.9	0.3	6.0	4.1	2.7	3.6	2.7	4.6	2.8	2.0	3.3	2.8	2.5	1.3	3.8	3.2	3.2
Norway	1.5	1.7	1.3	8.8	2.8	5.0	0.4	8.6	3.6	2.6	3.7	3.5	3.6	1.4	3.1	1.9	3.5	1.9	2.8	1.9	3.4	2.2
G7 mean	1.6	3.8	-1.1	6.3	2.2	7.2	0.0	15.1	4.2	2.6	4.1	3.1	4.3	1.9	2.0	2.2	2.1	2.6	2.0	1.9	3.2	2.8
G7 convergence	0.6	0.8	4.2	4.3	1.8	2.8	4.8	7.5	2.1	0.5	2.4	0.6	2.2	0.5	0.5	0.8	0.5	0.50	0.6	1.3	0.5	
Total mean	1.6	3.4	-0.8	7.7	2.4	5.7	0.5	13.6	3.9	2.6	3.6	3.1	4.1	1.9	1.9	2.2	2.0	2.5	1.8	1.9	3.0	2.7
Total convergence	0.5	1.1	3.3	4.0	1.5	2.6	3.5	8.6	1.5	0.6	1.8	0.8	1.5	0.5	0.6	0.5	0.8	0.50	0.7	1.0	0.5	

Note: Convergence is defined as the standard deviation of each country's summary statistic around the grand mean of the group of countries. Sources: See Data Appendix.

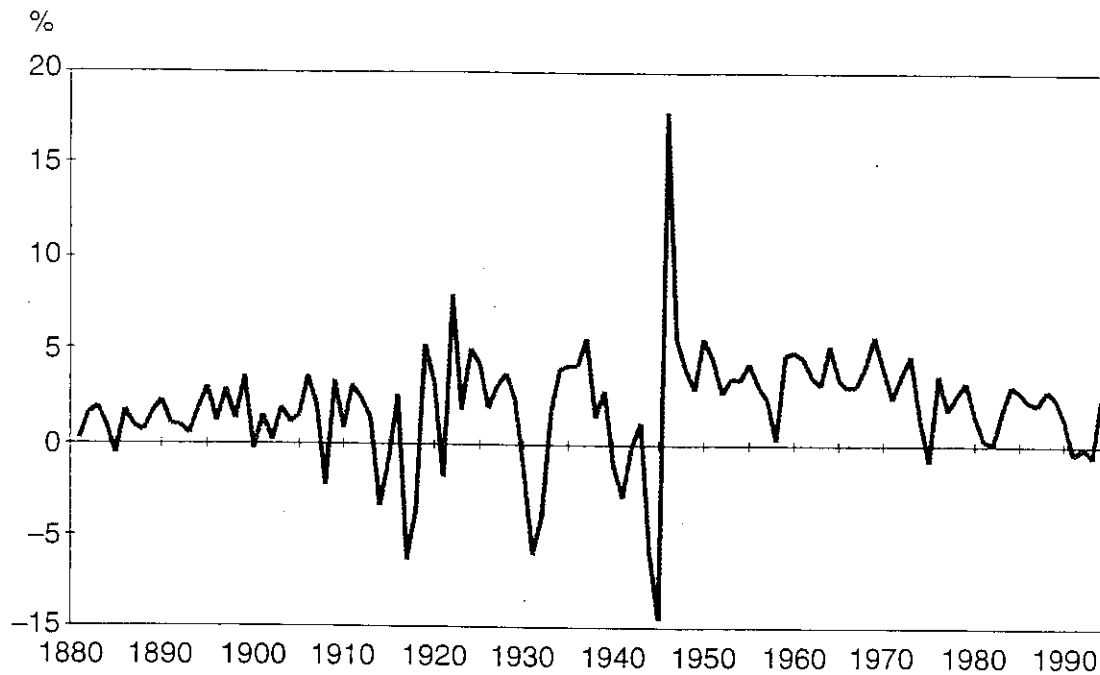


Figure 8.10 Real per capita income growth 1881–1995

finance (see Eichengreen (1992)). As the rise in expenditure was far from covered by increased taxation, budget deficits rose sharply in the belligerent countries (see Table 8.4). These countries resorted to debt financing (see Tables 8.5 and 8.6, and Figures 8.5 and 8.6). The volume of public debt increased dramatically during the First World War, primarily among the belligerents, but the non-belligerents were also affected (see Table 8.6).

3.2.2 *Monetary policy*

The enormous rise in government expenditure caused by the outbreak of war in 1914 exerted a profound pressure on the monetary authorities of the belligerents. The convertibility requirement was overruled by budgetary concerns and could no longer function as a restriction on monetary policy. Monetary policy became subordinated to the demands for immediate financing of the war effort, and monetary aggregates in all countries expanded rapidly (see Tables 8.1 and 8.2). The monetary base grew by 28.8 per cent per annum as an average for all countries during the First World War, compared to a growth rate of 2.9 per cent during the classical gold standard. The corresponding amounts for the money supply are 22 per cent and 4.7 per cent, respectively. As the cost of raising conventional taxes and borrowing mounted, the belligerents turned to the use of the inflation tax (seigniorage). Table 8.11, displaying

Table 8.11 Descriptive statistics on seignorage as a percentage of national income under different monetary regimes, 14 countries, 1881–1995 (annual data: mean and standard deviation)

	Gold Standard		First World War		Inter-war		Second World War		Bretton Woods		Floating exchange		Post-war									
	1881–1913		1914–1919		1920–1938		1939–1946		1947–1971		1973–1982		1983–1995									
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.								
USA	0.3	0.3	0.4	0.4	0.1	0.5	1.5	0.8	0.2	0.8	0.2	0.4	0.1	0.4	0.2	0.3	0.6					
UK	0.0	0.0	1.5	0.4	0.1	0.4	1.2	0.5	0.4	0.4	0.4	0.4	0.6	0.7	0.2	0.3	0.4	0.5				
Germany	0.2	0.2	7.3	3.1	2.0	4.1	5.6	3.5	0.9	0.5	1.1	0.3	0.8	0.6	0.5	0.5	0.5	0.8	0.6			
France	0.3	0.3	7.2	2.9	1.1	1.2	13.9	7.4	1.5	1.1	2.0	1.3	1.0	0.6	0.3	0.7	0.4	1.0	0.10.4	0.9	1.1	
Japan	0.5	0.9	2.0	1.6	0.2	0.8	13.0	22.6	1.6	1.9	2.8	1.2	0.3	0.7	0.6	0.9	0.7	0.60.5	1.2	1.5		
Canada	0.2	0.4	0.6	0.5	0.0	0.3	1.1	0.5	0.3	0.2	0.3	0.3	0.4	0.2	0.3	0.6	0.3	0.10.1	0.3	0.3		
Italy	0.2	0.6	6.3	2.1	0.1	2.7	10.2	8.8	2.0	2.0	1.7	1.7	2.2	2.2	1.7	1.5	2.8	1.2	0.91.1	1.9	1.7	
Belgium			2.7	4.0	1.6	1.8	20.1	13.4	1.9	5.0	3.0	7.2	0.8	0.5	0.3	0.4	0.7	0.5	0.1	0.2	1.1	3.6
Netherlands			3.1	1.7	0.0	1.4	13.0	11.3	0.7	0.7	0.8	0.9	0.6	0.4	0.5	0.7	0.5	0.2	0.50.9	0.6	0.7	
Switzerland	0.3	0.7	1.8	1.3	0.4	1.5	2.4	1.0	1.6	1.2	1.1	1.1	2.0	1.2	0.3	1.4	0.7	1.6	0.0	1.1	1.0	1.4
Sweden	0.3	0.4	1.3	1.2	0.1	0.6	1.3	0.7	0.5	0.4	0.6	0.6	0.5	0.1	0.8	1.2	0.8	1.0	0.81.3	0.7	0.9	
Denmark	0.2	2.0	1.4	0.8	-0.1	0.6	1.7	0.8	0.3	0.8	0.2	1.0	0.5	0.6	0.5	1.3	0.3	0.5	0.6	1.7	0.4	1.0
Finland	0.2	0.8	5.1	4.1	0.2	0.6	3.4	1.4	0.4	0.3	0.5	0.4	0.3	0.3	0.7	1.0	0.5	0.5	0.91.3	0.5	0.7	
Norway	0.2	0.3	1.5	0.7	0.0	0.6			0.7	1.3	0.7	1.9	0.7	0.3	0.5	0.4	0.8	0.4	0.3	0.3	0.6	0.9
G7 mean	0.2	0.4	3.1	1.4	0.4	1.2	5.8	5.5	0.9	0.9	0.9	1.0	0.8	0.6	0.5	0.5	0.8	0.6	0.40.4	0.7	0.8	
G7 convergence	0.2	0.3	3.2	1.2	0.7	1.4	5.8	7.7	0.7	0.7	0.9	0.9	0.7	0.7	0.5	0.5	0.9	0.40.3	0.3	0.6	0.6	
Total mean	0.2	0.5	2.8	1.6	0.4	1.1	6.3	5.2	0.9	1.1	0.9	1.4	0.8	0.5	0.5	0.7	0.7	0.6	0.4	0.7	0.7	1.0
Total convergence	0.1	0.5	2.5	1.3	0.6	1.1	6.4	6.7	0.7	1.2	0.9	1.8	0.6	0.6	0.4	0.5	0.6	0.40.3	0.5	0.5	0.9	

Notes: Seigniorage is defined as the change in banknote circulation 1881–1948 and the change in M0 1949–95; Germany excluded 1920–4; Belgium 1944; Denmark, France and Netherlands excluded 1945.

Convergence is defined as the standard deviation of each country's summary statistic around the grand mean of the group of countries.
Sources: See Data Appendix.

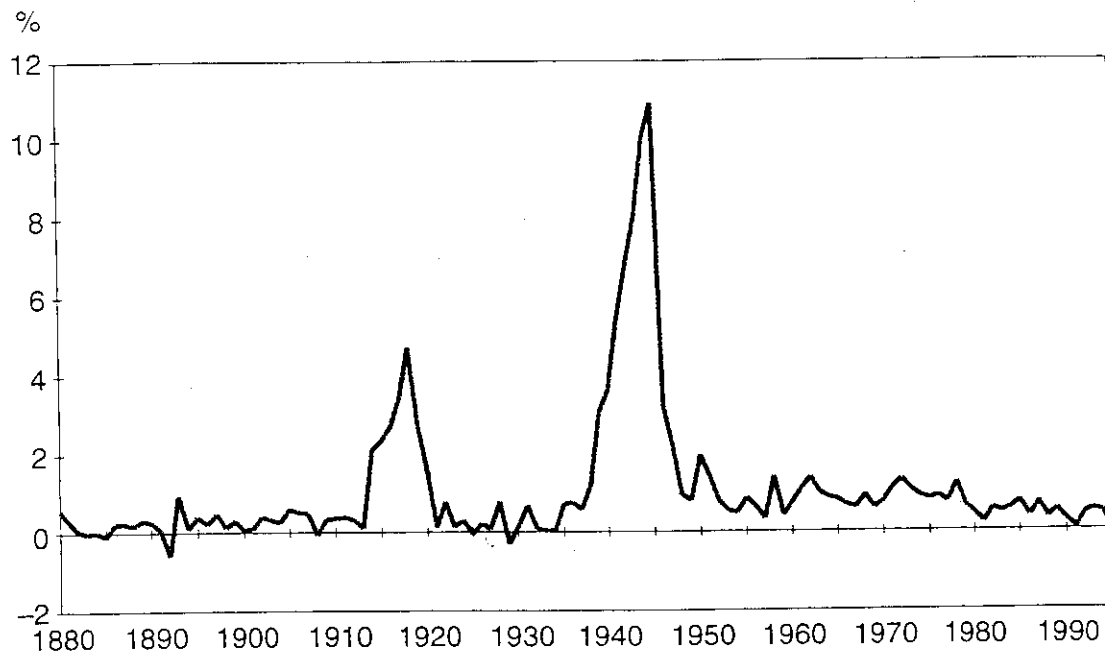


Figure 8.11 Seigniorage, 1881–1995

seigniorage as a percentage of national income under different monetary regimes, demonstrates the importance of the inflation tax during the First World War. Seigniorage revenue during the war was more important for Germany (7.3 per cent of national income) and France (6 per cent of national income) than for the UK (1.4 per cent of national income) and the USA (0.4 per cent of national income) (see Table 8.11). As we argue below, this in turn seriously hampered the ability of the former countries to deflate and establish financial order after the war.

The rise in the money supplies in the warring economies spread to neutral countries, which experienced a sudden boom in exports and a massive inflow of foreign exchange, thus increasing their money supplies.¹⁸

3.2.3 Price level, interest rates, exchange rates and real income

The price level in the world economy rose sharply during the First World War in the absence of the golden nominal anchor (see Table 8.7). The rise in prices (20 per cent) is roughly of the same order as the growth in the money supply (22 per cent). Nominal interest rates, however, did not display much movement, according to Table 8.8, rising from 3.6 per cent as an average during the classical gold standard to 4.7 per cent as an average during the First World War. The small rise, we conjecture, reflects partially the widely held expectations that interest rates would return to pre-war levels after the war, as well as interest-pegging policies followed by

the USA, UK, Canada and other countries (for the USA, see Toma (1997)). Exchange rates displayed wide movements, as expected under unstable monetary conditions (see Table 8.9). Real income growth turned negative in most countries engaged in war (see Table 8.10).

To sum up, the First World War marked a sharp difference in the conduct of fiscal and monetary policies in the global economy. It destroyed the world that had seen the gold standard evolve into the international monetary system. A return to a stable monetary system was high on the political agenda after the Versailles peace treaty.

3.3 The interwar period

The interwar is a period of several regimes. First, the return to gold that occurred in the mid-1920s; second the short-lived international gold standard; and third, the breakdown of the gold standard during the Great Depression in the 1930s.

After the First World War, governments wanted a return to stable monetary conditions. This step required two major decisions concerning fiscal and monetary policy. First, in several of the belligerent countries, a decision had to be made concerning the treatment of public debt, that is over the time path of budget surpluses to amortize outstanding debt. Governments had to choose whether to run contractionary fiscal policies, which would retire outstanding debt, or to default explicitly or implicitly via inflation. Any decision would have profound effects on the distribution of income between debtors and creditors.

Germany eventually defaulted on its debt through hyperinflation.¹⁹ France defaulted partially by running high inflation, returning to gold convertibility in 1926 at a greatly devalued parity. The French return to gold occurred after a long period of domestic political fighting over the treatment of public debt. The UK and the USA honoured their debts by running budget surpluses to amortize them.²⁰

Second, related to the treatment of debt, several countries had to decide whether to accept the inflation path developed during the war, or to carry out a deflationary policy to bring about a return to gold at the pre-war parity rate. That is, they had to make a choice to devalue or deflate their currencies after the wartime inflation. Countries with the highest rates of inflation decided to settle for *ex post* devaluations, returning to gold at a devalued rate compared to the pre-1914 rate. The cost of deflation was considered to be too high compared to the benefits.²¹

The gold standard was reinstated after the First World War as a gold exchange standard. The UK and other countries, alarmed by the post-war

experience of inflation and exchange-rate instability, were eager to return to the halcyon days of gold convertibility before the war. The system re-established in 1925 was an attempt to restore the old regime, but to economize on gold in the face of a perceived gold shortage. Based on principles developed at the Genoa Conference in 1922, members were encouraged to adopt central bank statutes that substituted foreign exchange for gold reserves and discouraged gold holdings by the private sector. The new system lasted for only six years, crumbling after the UK's departure from gold in September 1931. The system failed in the face of major economic disturbances because of several fatal flaws in its structure, and because it did not embody a credible commitment mechanism.²²

After the collapse of the gold exchange standard, the world in the 1930s retreated towards autarky. Policies widely followed included trade restrictions, exchange controls and bilateralism. The disappearance of the gold standard also allowed for new experiments with monetary and fiscal policies. Some countries adopted expansionary fiscal programmes, perhaps most prominently Sweden, with its expansionary 'crisis policy' based on the explicit idea that the budget should be balanced over the business cycle, and not on an annual basis. In the search for a new nominal anchor to replace the gold standard, Sweden was the first country to introduce a programme of price stabilization based on Knut Wicksell's norm. One of the major arguments proposed for the programme was to influence price expectations.²³

Monetary base and money stock growth fell back to the lowest average level of all regimes in the inter-war period (see Tables 8.1 and 8.2).²⁴ This is reflected in deflation in most countries (see Table 8.7).²⁵ After the First World War, government expenditure as a share of national income declined, most prominently among the former belligerent countries. The decline, however, did not imply a return to pre-1914 levels. The ratio then started to rise in the 1930s as a result of the Great Depression, reducing national income levels and increasing government expenditures (see Table 8.3 and Figure 8.3). Budget deficits nevertheless remained small (see Table 8.4 and Figure 8.4). Central government debt as a share of national income remained at an average level above the level reached during the First World War (see Table 8.5). The 1930s was hardly a period of 'Keynesian' expansionary fiscal policies, judging from the size of budget deficits and growth in the inter-war period (see DeLong (1998)).

Exchange rates exhibited considerable volatility in this period (see Table 8.9). Real growth was at its lowest and most volatile for most major countries, as would be expected (see Table 8.10).

3.4 The Second World War

The outbreak of war in 1939 caused an immediate and extremely sharp rise in government expenditure, sharper even than in 1914 (see Figure 8.3). Governments were faced with the same financing problems as they had during the First World War. Budget deficits as a share of national income were, on average, higher than during the First World War (see Table 8.4). Central government expenditure and debt as a percentage of national income reached an all-time high for many countries; for example, in the UK, the USA and Canada (see Table 8.5). The monetary aggregates as well as the price level increased sharply, moving on average in a way very similar to the pattern of the First World War (see Tables 8.1, 8.2 and 8.7), although price controls were used more effectively than during the First World War. Seigniorage reached high levels in many of the belligerents, while remaining low in the USA and the UK, as had been the case during the First World War (see Table 8.11).²⁶ Furthermore, both short- and long-term interest rates were pegged at low levels in all countries to aid the fiscal authorities in financing government expenditures (see Table 8.8).

The Second World War presents a pattern very similar to the First World War; with sudden, exogenously produced rise of government expenditure forcing monetary policy to serve the war effort. The same pattern is found among the neutral countries that stayed out of the war.

3.5 The Bretton Woods system

The Bretton Woods system was designed to incorporate the perceived lessons of the monetary turmoil of the inter-war period. Bretton Woods was the last convertible global regime. It can be viewed within the context of the gold standard because the USA (the most important commercial power) defined its parity in terms of gold, and all other members defined their parities in terms of US dollars.

The Articles of Agreement signed at Bretton Woods, New Hampshire in 1944 represented a compromise between American and British plans. They combined the flexibility and freedom for policymakers of a floating rate system that the British team wanted, with the nominal stability of the gold standard rule emphasized by the USA. The system established was one of pegged exchange rates, but members could alter their parities in the face of a fundamental disequilibrium. Members were encouraged to use domestic stabilization policy to offset temporary disturbances. Thus the Agreement made room explicitly for discretionary monetary and fiscal policies, whose use at best was minimal under the classical gold standard. These policies would be effective because of the presence of capital

controls. The International Monetary Fund was to provide temporary liquidity assistance and to oversee the operation of the system.

Although based on the principle of convertibility and although it became an asymmetric system, with the USA rather than the UK as the centre country, Bretton Woods differed from the classical gold standard in a number of fundamental ways. First, it was an arrangement mandated by an international agreement between governments, whereas the gold standard evolved more informally in a less centralized way. Second, domestic policy autonomy was encouraged, even at the expense of convertibility – in sharp contrast to the gold standard, where convertibility was the key feature. Third, capital movements were suppressed by controls.

The flaws of Bretton Woods echoed those of the gold exchange standard. Adjustment was inadequate, prices were downwardly inflexible and declining output was prevented by expansionary financial policy. Under the rules, the exchange rate could be altered but in practice rarely was because of the fear of speculative attacks, which in turn reflected market beliefs that governments would not follow the policies necessary to maintain convertibility (Eichengreen (1996)). Hence the system in its early years was propped up by capital controls and later by G10 co-operation. The liquidity problems resembled those of the inter-war gold exchange standard. As a substitute for scarce gold, the system relied increasingly on USA dollars generated by persistent US balance of payments deficits. The resulting asymmetry between the USA and the rest of the world was resented by the French. The growing risk of a run, as outstanding dollar liabilities increased relative to gold reserves, meant that the Bretton Woods system experienced a mounting confidence problem.

The Bretton Woods system collapsed between 1968 and 1971. The USA broke the implicit rules of the dollar standard by not maintaining price stability; that is, by expansionary monetary and fiscal policies. The rest of the world did not want to absorb additional dollars and thus accept inflation. Surplus countries (especially Germany) were reluctant to revalue. Another important source of strain on the system was the unworkability of the adjustable peg as capital mobility increased. Neither traditional policies nor international rescue packages could stop speculation against a fixed parity. The British eventually joined the French in forcing the Americans' hands by converting dollars into gold in the summer of 1971. The impasse was ended by President Richard Nixon's closing of the gold window on 15 August 1971.

Bretton Woods, like the gold standard, can be interpreted as a regime following a contingent rule. Unlike the example of Britain under the gold

standard, however, the commitment to maintain gold convertibility by the USA, the centre country, lost credibility by the mid-1960s. Also the contingency aspect of the rule proved unworkable. Besides being ill-defined, devaluations were avoided because they were viewed as an admission that policies lacked credibility through being accompanied by speculative attack even in the presence of capital controls. Once controls were removed, the system was only held together by G10 co-operation and once inconsistencies developed between the interests of the USA and other members, even co-operation became unworkable.

In conclusion, under Bretton Woods, gold still served as a nominal anchor. This link to gold constrained US monetary policy (at least until the mid-1960s) and therefore that of the rest of the world. This may explain the low inflation rates – see Table 8.7 – and the low degree of inflation persistence observed in the 1950s and 1960s (Alogoskoufis and Smith (1991); Bordo (1993a)). However, credibility was considerably weaker than under the gold standard.

The US dollar–gold standard was thus not as effective a nominal anchor as the classical gold standard (Giovannini (1993)). Moreover, when domestic interests clashed with convertibility, the anchor chain was stretched and then overthrown (Redish (1993)). This was evident in the US reduction and then removal of gold reserve requirements in 1965, the closing of the Gold Pool in 1968, and of the gold window itself in 1971. The absolute termination of a role for gold in the international monetary system was the Second Amendment to the Articles of Agreement in 1976.

3.5.1 *Monetary policy*

Monetary base and money stock growth began to increase in the USA in the mid-1960s, reflecting expansionary policy by the USA in the financing of the Vietnam War and the Great Society. This was transmitted to the rest of the world via fixed exchange rates. At the same time, European countries began following Keynesian full employment policies.²⁷ The inflation rate began to rise in this period. A growing tension between the expansionary monetary policies of the centre country, the USA, and the main European countries who imported inflation via persistent balance of payments surpluses, helped to precipitate the collapse of the system between 1968 and 1973 (Bordo (1993b)).

3.5.2 *Fiscal policy*

During the Bretton Woods period, fiscal policy was initially consistent with the monetary regime. As in the post-First World War period, government expenditure as a share of national income dropped sharply

after the Second World War, and stabilized at a level between 15 per cent and 20 per cent of national income in the 1950s and early 1960s (see Table 8.3). A major aim of fiscal policy was to amortize the public debt. Budget deficits reached a low of, on average, less than 2 per cent of national income (see Table 8.4).

During the convertible phase of the Bretton Woods system, from 1959 to 1971, the advanced countries enjoyed exceptional macroeconomic performance. It had the lowest and most stable inflation rate and, like the classical gold standard period, long-term interest rates were low, stable and exhibited a high degree of convergence (see Table 8.8). Moreover, real growth rates were the highest and most stable of any modern regime (see Table 8.10).

Although aggregate demand and supply shocks were smaller than under the gold standard, the convertible phase of the Bretton Woods system was short-lived (Bordo (1993a); Bayoumi and Eichengreen (1994)). This suggests that the reason for its brief existence was not the external environment but, like the gold exchange standard, structural flaws in the regime and the lack of a credible commitment mechanism.

3.6 Floating exchange rates

After the breakdown of the Bretton Woods system, the major countries turned in March 1973 to generalized floating exchange rates. This meant that major nations used stabilization policy to a larger extent than previously to satisfy domestic goals, paying less attention to external considerations. Although the early years of the floating exchange rate were often characterized as a dirty float, in that monetary authorities intervened extensively to affect exchange rate levels as well as their volatility, by the end of the 1970s, it had evolved into a system where exchange market intervention occurred primarily to smooth out fluctuations.

In recent years, floating exchange rates have been assailed from many quarters for excessive volatility in both nominal and real exchange rates, increasing macroeconomic instability and raising the costs of international transactions. Despite these perceived problems, the ability of the flexible regime to accommodate the problems of the massive oil price shocks of the 1970s and other shocks in subsequent years without significant disruption, and the perception that pegged exchange rate arrangements among major countries are doomed to failure, the prospects for significant reform of the present system at the world level seem remote. Indeed, the lessons from recent history suggest that major countries are not willing to subject their domestic policy autonomy to that of another country whose commitment cannot be ensured in an

uncertain world, nor to a supernational monetary authority they cannot control.

3.6.1 *Monetary policy*

Base and money growth increased in the decade following the collapse of the Bretton Woods system (see Tables 8.1 and 8.2). The 1970s was a period of rapid money growth and high inflation, as monetary authorities in most countries, following the two oil price shocks, were unwilling to conduct anti-inflationary policies that would jeopardize their primary goal of full employment. At the end of the decade, under pressure of an electorate and a professional opinion critical of high inflation, policies were reversed in major OECD economies.²⁸

After a sharp recession in the early 1980s, inflation returned to the levels prevalent in the early Bretton Woods years. Along with disinflation, nominal interest rates declined significantly during the 1980s. The period of high inflation, followed by disinflation, was also associated with lower real growth than under Bretton Woods (see Tables 8.7 and 8.10).

3.6.2 *Fiscal policy*

The disappearance of a global regime of fixed exchange rates relaxed the fiscal norm that had accompanied the Bretton Woods system. The negative macroeconomic disturbances caused by the two oil price shocks induced many countries to increase government expenditure – the ratio of government expenditure to national income reached a level above that of the Second World War in several countries (see Figure 8.5). Many countries resorted to debt finance (see Tables 8.4–8.6).

On average, nominal debt as a percentage of national income increased from 34.5 per cent for the convertible Bretton Woods period to 50.2 per cent for the period 1983–95 (see Table 8.5). The ratio did not expand in a uniform way across countries, however. We may distinguish one group of steadily rising ratios from the early 1970s (Japan, Canada, Italy, Belgium, the Netherlands, Denmark and Sweden) and one group with stable or falling ratios (the USA, the UK, Germany, France, Finland and Norway) prior to the crises of the 1990s.²⁹

3.6.3 *The European Monetary System*

After the breakdown of the Bretton Woods system, Europe has been moving towards creating a monetary union with perfectly fixed exchange rates. This reflects the desire of the members of the European Union (EU) for economic and political integration. On the road to that end, the Exchange Rate Mechanism (ERM) within the European Monetary System

(EMS), established in 1979, was modelled after Bretton Woods (although not based on gold), with more flexibility and better financial resources (Bordo (1993a)). It appeared successful in the late 1980s, when member countries followed policies similar to Germany, the centre country.

The ERM broke down in 1992–3 in a manner similar to the collapse of Bretton Woods in 1968–71. It also collapsed for similar reasons – because pegged exchange rates, capital mobility and policy autonomy do not mix. It collapsed in the face of massive speculative attacks on countries following policies inconsistent with their pegs to Germany, as well as on countries that seemingly were following the rules, but whose ultimate commitment to the peg in the face of rising unemployment was doubted by agents in financial markets. The policy responses to the reunification of Germany were instrumental in initiating the breakdown of the ERM.

A major problem facing European countries has been to co-ordinate their fiscal and debt policies. Countries with relatively high public deficits, and thus rising public debt, such as Italy, have not been able to pursue such tight monetary policies as Germany. The stability pact within the EU is designed to bring about the fiscal discipline deemed necessary for EMU.

4 Summary of the empirical evidence

We summarize briefly the descriptive data displayed in the figures and tables in order to examine the differences and similarities between historical regimes. Before doing so, however, we consider some theoretical issues concerning regime choice.

Traditional theory posits that a convertible regime, such as the classical gold standard which prevailed from around 1880 until the outbreak of the First World War, is characterized by a set of self-regulating market forces that tend to ensure long-run price level stability. These forces operated through the mechanism commonly described by the classical commodity theory of money (Bordo (1984)). According to that theory, changes in gold production will eventually offset any inflationary or deflationary price-level movements. The problem, however, is that unexpected shocks to the supply or demand for gold can have significant short-run effects on the price level.

In an international convertible regime, pegging nations' currencies to the fixed price of gold provides a stable nominal anchor to the international monetary system. Such stability, however, comes at the expense of exposure to foreign shocks, which can produce volatile output and employment. Adherence to the international convertible regime also implies a loss of monetary and fiscal independence, since under such a

regime the authorities' prime commitment is to maintain convertibility of their currencies into the precious metal and not to stabilize the domestic economy.

In a fiat money regime, in theory, monetary authorities could use open market operations, or other policy tools, to avoid the types of shocks that may jar the price level and real activity under a specie standard, and hence provide both short-run and long-run nominal stability. It also allows greater fiscal policy autonomy. In addition to giving the authorities policy independence, adhering to a flexible exchange rate fiat regime provides insulation against foreign shocks.³⁰

As in a convertible regime, countries following fiat money regimes can adhere to fixed exchange rates with each other. The key advantage of doing so is to avoid the transaction costs of exchange in international trade. However, a fixed rate system based on fiat money does not provide the stable nominal anchor of the specie convertibility regime unless all the members define their currencies in terms of the currency of one dominant country, for example the USA under Bretton Woods, or Germany in the EMS, which in turn follows a rule that requires it to maintain price stability.

Finally, in a fiat money flexible-rate regime, the absence of the nominal anchor of the fixed price of specie opens up the possibility that monetary authorities, to satisfy the political goals of the government – for example, its fiscal demands or demands to maintain full employment – could use the printing press to engineer high inflation.

The theoretical literature concludes that it is difficult to provide an unambiguous ranking of monetary and fiscal arrangements. Hence, empirical evidence is crucial in assessing the performance of alternative regimes. In the following, we summarize the evidence on the different measures of stabilization policies and the macroaggregates considered in Section 3.

4.1 Monetary policy

4.1.1 *The monetary base and the money stock*

During peacetime conditions, base money and broad money growth (M2) were considerably more rapid across all countries after the Second World War than before the war (see Tables 8.1 and 8.2). There is not much difference between Bretton Woods and the subsequent floating regime, nor between the preconvertibility and the convertibility periods.

The growth rates of the monetary base and the money stock showed the most convergence during the fixed-exchange-rate gold standard and the greatest divergence during the pre-convertible Bretton Woods period.

The two world wars stand out as periods of high and variable monetary aggregate growth, especially during the First World War. In recent years we have seen a decline in monetary aggregate growth, and in inflation, and thus a return to earlier norms.

4.2 Fiscal policy

4.2.1 *Government expenditure less tax revenues*

The budget deficit was low during all convertible regimes. Large deficits, which occurred during three episodes – the First and Second World Wars and during the floating exchange rate period – were not consistent with fixed exchange rates. The evidence of large deficits during the world wars is consistent with optimal public finance/tax smoothing. Surpluses after both world wars were used to amortize public debt. Large and persistent deficits in peacetime under the managed float, however, are inconsistent with the rules of convertible regimes.

4.2.2 *Central government debt*

The debt-to-income ratio prior to 1970 is determined by one major force, the occurrence of war (see Figures 8.3 and 8.4). After the First World War, debt was reduced by governments running surpluses in major countries such as the USA, the UK and Canada as well as the small, non-belligerent European countries but not in France, Germany and Italy. After the Second World War, public debt was largely reduced by inflation, a phenomenon inconsistent with classical tax smoothing (Grossman (1990)). Under the Bretton Woods system, most countries exhibited falling debt-to-national-income ratios.

In the post-Bretton Woods period we observe rising and high ratios. This reflects, among other things, activist stabilization policy, an increased role for governments, and the absence of the constraints of a convertible regime. Differences across countries in their debt behaviour is in turn reflected in differences in inflation rates and exchange rate behaviour.

In the 1990s, we observe a decline in the debt-to-income ratios for some countries as well as a sharp rise in the ratios for others. We conjecture that this pattern reflects, *inter alia*, asymmetric shocks and different policy preferences.

4.2.3 *Seigniorage*

Seigniorage revenue measured as a share of national income represents a major source of revenue only during the First and Second World Wars in our sample of advanced countries (see Table 8.11). Great differences across

countries appeared in the wartime deficits financed by seigniorage. Countries such as Germany and France, which resorted to inflation finance, had serious difficulties in returning to financial stability after the Second World War.

Seigniorage as defined here was lowest in the 1970s and 1980s, when the rate of inflation was relatively high. In our calculations of the inflation tax we ignore the fall in the real value of public debt caused by inflation. Thus our measure gives a minimum estimate of the inflation tax. See Grossman (1990).

4.2.4 Central government expenditures to national income

This structural measure, reflecting the attitude of the electorate towards public/private solutions to economic problems, has been rising since the First World War. Following the sharp increase during the war, it declined in the 1920s almost to the pre-1914 level. Then it started on a new increase during the Great Depression, accelerating during the Second World War, then declining after the war to slightly above the pre-war level. A large peacetime increase commenced in the late 1960s, which was halted by the 1980s.

4.2.5 Inflation

The rate of inflation was lowest during the classical gold standard period (see Table 8.7). This was true for every country except Japan, which did not adopt the gold standard until 1897. During the inter-war period, mild deflation prevailed. The rate of inflation during the Bretton Woods period was on average, and for every country except Japan, lower than during the subsequent floating exchange rate period.

During the Bretton Woods convertible period, the inflation rate in most countries was lower than in the preceding preconvertible subperiod; and the reverse was true for Germany, Switzerland and Denmark.³¹ During the floating regime, inflation was much lower on average in the 1980s than in the 1970s.³²

In general, the descriptive evidence of lower inflation under the gold standard and the Bretton Woods convertible regime than under the other regimes is consistent with the view that convertible regimes provide an effective nominal anchor. The markedly low inflation of the 1990s suggests that the equivalent of the convertibility principle may be operating at present. At the same time, evidence that inflation variability on average was higher in the classical gold standard period than in most other regimes is consistent with the workings of the commodity theory of money and the price-specie-flow mechanism. Alternatively, stabilization

policies in the post Second World War period may have contributed to lower inflation variability.

The evidence on inflation and inflation variability is also consistent with the behaviour of two other nominal variables. First, as pointed out above, money growth was generally lowest under the classical gold standard and during the inter-war period across all countries. Second, long-term nominal interest rates were lowest during the classical gold standard period. During Bretton Woods they were lower than in the recent float (also see McKinnon (1988)).

4.2.6 *Real per capita GNP*

Generally, the Bretton Woods period, especially the convertible period, exhibited the most rapid output growth of any monetary regime for fourteen countries (see Table 8.10). Output variability was also lowest in the convertible subperiod of Bretton Woods, but because of higher variability in the pre-convertible period, the Bretton Woods system as a whole was more variable than the floating period.³³ Both pre-Second World War regimes exhibit higher variability than their post-Second World War counterparts.³⁴

To link rapid growth in the industrialized countries in the quarter century following the Second World War to the Bretton Woods international monetary system, seems less compelling than for various aspects of macroeconomic performance. There is little conclusive evidence linking exchange rate volatility to either trade flows or the level of investment, avenues by which a stable exchange rate regime might have affected economic growth.³⁵

It is more likely that the Bretton Woods arrangements contributed to post-war growth by being part of the overall package creating political and economic stability – ‘the Pax Americana’, that was a reaction to the chaos of the inter-war and Second World War periods. In this view, rapid post-war growth represented a ‘catch up’ by the European nations and Japan from low levels of per capita output compared to those of the leading industrial country, the USA. The ‘catch up’ by these nations was encouraged by the USA. They adopted the leader’s best-practice technology and hence grew at a much more rapid rate than before (Abramovitz (1986)).

Adherence to the convertibility rules of the Bretton Woods system by the USA and other industrialized countries may possibly explain the stability of real output in that regime. Money growth, but not the growth of real government spending, was less variable under Bretton Woods than under the succeeding float (Bordo (1993b), Eichengreen (1993)). Also

demand (transitory) shocks, presumably incorporating policy actions, were lowest under Bretton Woods (Bordo (1993a), Bayoumi and Eichengreen (1994)). According to Eichengreen (1993), the credibility of commitment to the nominal anchor, as evidenced by a low degree of inflation persistence under Bretton Woods, made inflationary expectations mean reverting. This produced a flatter short-run aggregate supply curve than under the float where, in the absence of a nominal anchor, inflationary expectations became extrapolative. Under these conditions, stabilization policy could be effective in stabilizing output.³⁶

That activist stabilization policy, both monetary and fiscal, was in the main responsible for the low real output variability under Bretton Woods is doubtful. For the USA, activist Keynesian policies were a product of the late 1960s and 1970s and, for the other countries, the ongoing conflict between internal and external balance dominated policymaking. A more likely explanation for real output stability is the absence of serious supply shocks.

In summary, the gold standard and convertible Bretton Woods regime exhibited the most stability of financial variables for the fourteen countries. In addition, the Bretton Woods convertible regime exhibited the best overall macroeconomic performance of any regime.³⁷ As the summary statistics in the tables show, both nominal and real variables were most stable in this period. However, the floating rate regime, on most criteria, was not far behind the Bretton Woods convertible regime.³⁸

These results agree with the views of Leijonhufvud (see Bordo and Jonung (1996)) and others, that convertibility rules in the past have been associated with superior performance of nominal variables. However, there is little evidence that adherence to convertibility rules has been associated with better real performance, as can be seen in a comparison between the recent float and the gold standard.

5 Conclusions

This chapter has surveyed the historical experience of monetary and fiscal regimes during the twentieth century for the developed economies of the world. Our sifting through the evidence suggests a number of conclusions.

First, a salient theme in our survey is that the convertibility rule or 'convertibility principle', whereby monetary authorities attach primary importance to specie convertibility, which dominated both domestic and international aspects of the monetary and fiscal regime before the First World War, has since declined in importance, in particular after the breakdown of the Bretton Woods system. This reflects, in our opinion,

primarily the preferences of electorates and policymakers within major nations, to give more emphasis to short-run stabilization of the real economy through monetary and fiscal measures.

Policy techniques and doctrine that developed under the pre-First World War convertible regime proved to be inadequate to deal with domestic stabilization goals in the vastly changed environment of the inter-war period, in which financial, economic and political institutions and relationships were greatly transformed from that of the pre-1914 world. This transformation set the stage for the decline of the old regime and the search for new monetary, financial and fiscal techniques to stabilize economic behaviour.

In the post-Second World War era, the gradual abandonment of the convertibility principle, and its eventual replacement by the goal of full employment in many countries, combined with the legacy of inadequate policy tools and theory developed in the inter-war period, paved the way for the Great Inflation of the 1970s, following in the wake of the two oil price shocks. This is also reflected in the large rise in public debt in the 1970s, and in particular in the 1980s. In the 1990s there has been an apparent shift back to the policy preferences and policy behaviour of the pre-1914 period. Thus the concept of a nominal anchor has returned to prominence recently in the form of the inflation targeting adopted in several OECD countries.

Second, the evidence suggests the existence of a close interaction between the monetary regime, (that is, the behaviour of the central bank/monetary authorities) and the fiscal regime (that is, the tax and spending behaviour of governments) as reflected in the evolution of budget deficits and public debt. Prior to the 1970s, a monetary regime based on the commitment to convertibility of the domestic currency into specie, or to a foreign currency, was the prevailing pattern in the world economy. Under this institutional arrangement, the monetary regime disciplined the fiscal regime – that is, the monetary regime imposed binding constraints on fiscal policies. There was one major exception to this rule, where fiscal demands determined monetary policies, and that was in the event of a major war and its immediate aftermath.

The 'convertibility principle' was abandoned effectively in the 1960s before the Bretton Woods system was formally terminated in the period 1971–3. Once the Bretton Woods arrangements were abandoned, the constraints over stabilization policies were weakened and monetary policies in a number of countries became subordinated to fiscal demands. After the breakdown of the Bretton Woods system, monetary policies were used to stimulate aggregate demand to maintain full employment. This in

turn created inflationary pressure. At the same time, debt-financed fiscal policies – although not having a direct inflationary impact – posed the threat of inflation, because of the increased likelihood that monetary authorities would have ultimately to finance the deficits. In the event of a debt default, an exorbitant risk premium would develop.

The return to the convertibility principle implies a return to a rule or rule-like behaviour in which monetary policy is geared towards the goal of low inflation, and the level of debt is to be kept sufficiently low to avoid threatening monetary stability. In many ways, the advent of inflation targeting has great similarities with the gold standard period. However, there are important differences. The monetary system is at the time of writing based on a managed fiat system – not on an automatic specie system. The anchor is thus a managed not an automatic one.

For the future, our prediction is that if fiscal balance is achieved in most major economies, monetary regimes based on either an internal commitment norm, such as price stability, or an external commitment to a foreign currency will prevail. Thus, a nominal anchor, similar to what was once embodied in the specie convertibility principle, will again keep monetary and fiscal policies in check.

Data Appendix

Belgium

Population 1880–1988: Mitchell (1992); 1989–95: *IFS*, series 99Z.

Real national income growth 1880–1920: Not available; 1921–39: GNP, E. Buyst (1997), 'New GNP Estimates for the Belgian Economy During the Interwar Period', *Review of Income and Wealth*, vol. 43, pp. 357–75, table 4; 1940–47: Not available; 1948: NNP, Mitchell (1992); 1949–53: GDP, Mitchell (1992), 1954–94: GDP, *IFS*, series 99B.P; 1995: *OECD Economic Outlook*.

Nominal national income 1880–1912: Not available; 1913–19: Constructed from CPI and interpolated data on real NNP; 1920–39: GNP, Buyst (1997), table 4; 1940–46: Interpolated for 1940, 1942 and 1944–45; 1946–47: Chained NNP, Mitchell (1992); 1948–52: GDP, Mitchell (1992); 1953–95: GDP, *IFS*, series 99B.

Inflation 1880–1948: CPI, Mitchell (1992), except 1914–20 and 1941–6: not available; 1949–95: CPI, *IFS*, series 64.

Nominal exchange rate 1880–1914: Data supplied by Marc Flandreau; 1915–47: International Monetary Fund; 1948–95: *IFS*, series RF.

Long-term interest rate 1880–1969: Yield of long-term Belgian Government Securities (3% Rentes, 4% Unified Debt (No Maturity), 2.5% Rentes and

Government Bond Average), Homer and Sylla (1991), tables 30 and 66, except 1914–18: not available; 1970–95: Government bond yield, *IFS*, series 61.

Money stock growth 1880–1971: M1, Statistical Appendix in J. Delbeke (1988), *Geld en Bankkrediet in België, 1877–1983*, Klasse der Letteren, Jaargang 50, Nr. 129, Brussels: Koninklijke Academie voor Wetenschappen, Letteren en Schone Kunsten van België, table 1.2, column 7 and table 1.3, column 9, except 1914–19 and 1941–6: not available; 1972–95: Money, *IFS*, series 34.

Monetary base growth 1880–1950: Banknote circulation, central bank issues, Mitchell (1992); 1951–95: Reserve money, *IFS*, series 14.

Central government expenditure and revenues 1880–1969: Mitchell (1978), except 1913–19 and 1940: not available; 1970–94: *IFS*, series 82 and 81. (Note: Change of definition in 1970.)

Central government debt 1880–1939: Data supplied by Erik Buyst at the Katholieke Universiteit in Leuven, except 1915–18: not available; 1948–94: *IFS*, series 88A + 89A.

Canada

Population 1880–1955: M. C. Urquhart and K. A. H. Buckley (1965) *Historical Statistics of Canada*, Montreal: Macmillan; 1956–95: *IFS*, series 99Z.

Real national income growth 1880–1926: GNP, M. C. Urquhart (1986) 'New Estimates of Gross National Product, Canada, 1870–1926: Some Implications for Canadian Development', in S. L. Engerman and R. E. Gallman (eds), *Long-Term Factors in American Economic Growth*, pp. 9–94, Studies in Income and Wealth, vol. 51, NBER, University of Chicago Press, table 2.9; 1927–48: GNP, Mitchell (1993); 1949–95: GDP, *IFS*, series 99B.R.

Nominal national income 1880–1925: GNP, Urquhart (1986), table 2.9; 1926–47: GNP, Mitchell (1993); 1948–95: GDP, *IFS*, series 99B.C.

Inflation 1880–1914: Interurban–Intertemporal CPI, R. C. Allen (1990) *Real Income in the English Speaking World*, University of British Columbia Press; 1915–48: CPI, Urquhart and Buckley (1965); 1949–95: CPI, *IFS*, series 64.

Nominal exchange rate 1880–1914: Gold standard, rate = unity; 1915–47: Federal Reserve Board (1943 and 1976) *Banking and Monetary Statistics 1 and 2*; 1948–95: *IFS*, series RF.

Long-term interest rate 1880–1919: Government of Canada long-term bond yield, E. P. Neufeld (1972) *The Financial System of Canada*, Toronto: Macmillan, table 15.2, except 1914–18: M. D. Bordo and L. Jonung (1987) *The Long-Run Behaviour of the Velocity of Circulation, The International Evidence*, Cambridge University Press, p. 160; 1920–79: Dominion of Canada, long-term bond yield, Homer and Sylla (1991), table 75; 1980–95: Government bond yield, long-term, *IFS*, series 61.

Money stock growth 1880–1948: M2, definition and sources are given in Bordo and Jonung (1987), pp. 154–155; 1949–95: Money plus quasi-money, *IFS*, series 35L.

Monetary base growth 1880–1948: Currency in circulation, Mitchell (1993); 1949–95: Reserve money, *IFS*, series 14.

Central government expenditure and revenues 1880–1947: Mitchell (1993); 1948–94: *IFS*, series 82 and 81.

Central government debt 1880–99: F. H. Leacy, M. C. Urquhart and K. A. H. Buckley (1983) *Historical Statistics of Canada*, 2nd edn, Ottawa: Statistics Canada, series H37 and H38; 1900–95: Statistics Canada, CANSIM matrix 3199.

Denmark

Population 1880–1988: Mitchell (1992); 1989–95: *IFS*, series 99Z.

Real national income growth 1880–1950: GDP, Mitchell (1992); 1951–95: GDP, *IFS*, series 99B.P.

Nominal national income 1880–1949: GDP, Mitchell (1992); 1950–95: GDP, *IFS*, series 99B.

Inflation 1880–1949: CPI, Mitchell (1992); 1950–95: CPI, *IFS*, series 64.

Nominal exchange rate 1880–3: Not available. 1884–1947: Annual Report of the Bank of Denmark (various issues); 1948–95: *IFS*, series RF.

Long-term interest rate 1880–1947: Rate of interest on consols (yearly average), Danmarks statistik (1969), *Kreditmarkedsstatistik*; 1948–95: Government bond yield, *IFS*, series 61.

Money stock growth 1880–1971: Borgernes Likviditet (M2), N. Kjærgård (1991), *økonomisk vækst: En økonometrisk analyse af Danmark 1870–1981*, Copenhagen: Jurist- og økonomforbundets Forlag, pp. 582–3, table 3, series AM; 1972–95: Money plus quasi-money, *IFS*, series 35L.

Monetary base growth 1880–1948: Bank note circulation, central bank issues, Mitchell (1992), except 1892: not available; 1949–95: Reserve money, *IFS*, series 14.

Central government expenditure and revenues 1880–1947: Mitchell (1992); 1948–95: *IFS*, series 82 and 81.

Central government debt 1880–1978: H. C. Johansen (1985), *Dansk økonomisk statistik 1814–1980*, in H. P. Clausen, S. Ellehöj and S. Mörch (1985) *Danmarks historie, Bind 9*, Copenhagen: Gyldendal; 1979–95: Danmarks statistik, *Statistisk årsbog* (various issues).

Finland

Population 1880–1988: Mitchell (1992); 1989–95: *IFS*, series 99Z.

Real national income growth 1880–1980: GDP, Statistical Appendix in R. Hjerppe (1989) *The Finnish Economy 1860–1985, Growth and Structural Change*, Bank of Finland, Helsinki: Government Printing Centre, table 1; 1981–95: GDP, *IFS*, series 99B.P.

Nominal national income 1880–1979: GDP, Hjerppe (1989), table 2A; 1980–95: GDP, *IFS*, series 99b.

Inflation 1880–1980: Cost-of-living index, Hjerppe (1989), table 13; 1981–95: CPI, *IFS*, series 64.

Nominal exchange rate 1880–1910: Not available; 1911–47: Derived from Sveriges riksbank, *Riksbankens årsbok* (various issues) (Annual Report of the Bank of Sweden); 1948–95: *IFS*, series RF.

Long-term interest rate 1880–1960: Not available; 1961–95: Non-central government taxable public bond yield (from 1994, taxable 5-year central government bond yield), *OECD Economic Outlook*, series IRL.

Money stock growth 1880–1971: M2, T. Haavisto (1992) *Money and Economic Activity in Finland 1866–1985*, Ph.D. thesis, Lund Economic Studies no. 48, Lund University, average of end-of-month figures in table 4A.2; 1972–95: Money plus quasi-money, *IFS*, series 35L.

Monetary base growth 1880–1948: Banknote circulation, central bank issues, Mitchell (1992); 1949–95: Reserve money, *IFS*, series 14.

Central government expenditure and revenues 1880–1: Not available; 1882–1948: Mitchell (1992); 1949–94: *IFS*, series 82 and 81.

Central government debt 1880–1974: R. Hjerppe (1996), *Finland's Historical National Accounts 1860–1994: Calculation Methods and Statistical Tables*, Jyväskylä; 1975–95: Statistics Finland, *Statistisk årsbok* (various issues).

France

Population 1880–1949: Mitchell (1978); 1950–95: *IFS*, series 99Z.

Real national income growth 1880–1950: GDP, Mitchell (1992), except 1914–20 and 1939–50: GDP, A. Maddison (1995) *Monitoring the World Economy 1820–1992*, OECD, table C-16a; 1951–95: GDP, *IFS*, series 99B.R.

Nominal national income 1880–1948: GDP, Mitchell (1992); except 1914–19 and 1939–48: Constructed from data on real GDP and CPI; 1949: GNP, Mitchell (1992); 1950–95: GDP, *IFS*, series 99B.C.

Inflation 1880–1949: CPI, Mitchell (1992); 1950–95: CPI, *IFS*, series 64.

Nominal exchange rate 1880–1947: M. Saint-Marc (1983) *Histoire Monétaire de la France 1880–1980*, Paris: Presses Universitaires de la France; 1948–95: *IFS*, series RF.

Long-term interest rate 1880–1947: Yield of long-term French government securities (3% Rentes), Homer and Sylla (1991), tables 25 and 62; 1948–95: Government bond yield, *IFS*, series 61.

Money stock growth 1880–97: M1, Saint-Marc (1983); 1898–1977: M2, J.-P. Patat and M. Lutfalla (1990) *A Monetary History of France in the Twentieth Century*, London: Macmillan, tables 1.4, A2, A3 and A5; 1978–95: M2, *IFS*, series 38NB.

Monetary base growth 1880–1948: Banknote circulation, central bank issues, Mitchell (1992); 1949–95: Reserve money, *IFS*, series 14.

Central government expenditure and revenues 1880–1949: Mitchell (1992); 1950–95: *IFS*, series 82 and 81.

Central government debt 1880–9: Data supplied by M. Flandreau; 1890–1939: P. Villa (1994) *A Century of Macroeconomic Data*; 1940–50: Not available; 1951–94: *IFS*, series 88B + 89B.

Germany

Population 1880–1979: Appendix 2 in A. Sommariva and G. Tullio (1987) *German Macroeconomic History 1880–1979*, London: Macmillan, pp. 234–6; 1980–95: *IFS*, series 99Z.

Real national income growth 1880–1979: NNP, Sommariva and Tullio (1987), pp. 226–8; 1980–95: GDP, *IFS*, series 99B.R. (Unified Germany from 1991.)

Nominal national income 1880–1949: NNP, Mitchell (1992), except 1914–24 and 1939–49: Constructed from data on real NNP and CPI; 1950–95: GDP, *IFS*, series 99B.C. (Unified Germany from 1991.)

Inflation 1880–1949: CPI, Sommariva and Tullio (1987), pp. 231–4; 1950–95: CPI, *IFS*, series 64.

Nominal exchange rate 1880–1947: Sommariva and Tullio (1987), pp. 231–4; 1948–95: *IFS*, series RF.

Long-term interest rate 1880–1975: High grade bond yield, S. Homer and R. Sylla (1991) *A History of Interest Rates*, New Brunswick: Rutgers University Press, tables 32 and 68, except 1922–3, 1944–7 and 1954–5: not available; 1976–95: Mortgage bond yield, *IFS*, series 61A.

Money stock growth 1880–1913: M2, Data underlying M. D. Bordo (1986), 'Financial Crises, Banking Crises, Stock Market Crashes and the Money Supply: Some International Evidence' in F. Capie and G. Wood (eds), *Financial Crises and the*

World Banking System, London: Macmillan; 1914–25: Not available; 1926–38: M2, Deutsche Bundesbank (1976), *Deutsches Geld und Bankwesen in Zahlen 1876–1975*, Frankfurt am Main: Fritz Knapp GmbH, pp. 14 and 18; 1939–49: Not available; 1950–71: M2, Deutsche Bundesbank, *Monthly Reports* (various issues); 1972–95: Money plus quasi-money, *IFS*, series 35L.

Monetary base growth 1880–1950: Banknote circulation, total issues, Mitchell (1992), except 1945–48: not available; 1951–95: Reserve money, *IFS*, series 14.

Central government expenditure and revenues 1880–1951: Mitchell (1978), except 1922–3 and 1935–49: not available; 1952–95: *IFS*, series 82 and 81. (Note: Change of definition in 1970).

Central government debt 1880–1945: Deutsche Bundesbank (ed.) (1988) *40 Jahre Deutsche Mark. Monetär Statistiken 1948–1987*, Frankfurt am Main: Fritz Knapp. 1946–49: Not available; 1950–94: *IFS*, series 88.

Italy

Population 1880–1975: Istituto centrale di statistica (1976) *Sommario di Statistiche Storiche dell'Italia 1861–1975*, Rome; 1976–95: *IFS*, series 99Z.

Real national income growth 1880–1951: GNP, Mitchell (1992); 1952–60: GDP, Mitchell (1992); 1961–7: GDP, *IFS*, series 99B.R; 1968–95: GDP, IMF (1997) *International Financial Statistics Yearbook 1997*, Washington DC, series 99B.R.

Nominal national income 1880–1950: GNP, Mitchell (1992); 1951–82: GDP, *IFS*, series 99B.C.; 1983–95: GDP, IMF (1997), series 99B.C.

Inflation 1880–1948: CPI, Statistical Appendix in M. Fratianni and F. Spinelli (1991) *Storia Monetaria d'Italia*, Milan: Arnoldo Mondadori Editore, pp. 66–71, series CLI; 1949–95: CPI, *IFS*, series 64.

Nominal exchange rate 1880–1947: Fratianni and Spinelli (1991), pp. 87–9, series ELUS; 1948–95: *IFS*, series RF.

Long term interest rate 1880–1979: Fratianni and Spinelli (1991), pp. 82–4, series RIL; 1980–95: Government bond yield, Medium-Term, *IFS*, series 61.

Money stock growth 1880–1980: M3, Fratianni and Spinelli (1991), pp. 48–51, series U1+U2+D; 1981–95: M2, IMF (1997), series 38N.

Monetary base growth 1880–1955: Banknote circulation, total issues, Mitchell (1992); 1956–71: Reserve money, *IFS*, series 14; 1972–95: Reserve money, IMF (1997), series 14.

Central government expenditure and revenues 1880–1949: Mitchell (1992); 1950–91: *IFS*, series 82 and 81.

Central government debt 1880–1947: Fratianni and Spinelli (1991); 1948–95: *IFS*, series 88.

Japan

Population 1880–1949: Bureau of Statistics (1957) *Japan Statistical Yearbook*; 1950–95: *IFS*, series 99Z.

Real national income growth 1880–84: Not available; 1885–1929: GNP, B. R. Mitchell (1991) *International Historical Statistics: Asia*, New York: Stockton Press; 1930–56: GDP, Mitchell (1991), except 1945 and 1952: GDP, Maddison (1995), table C-16a; 1957–95: GDP, *IFS*, series 99B.R.

Nominal national income 1880–4: Not available; 1885–1929: GNP, Mitchell (1991); 1930–55: GDP, Mitchell (1991), except 1945: Constructed from data on real GDP and CPI; 1956–95: GDP, *IFS*, series 99B.C.

Inflation 1880–1922: WPI, Mitchell (1991); 1923–48: CPI, Mitchell (1991); 1949–95: CPI, *IFS*, series 64.

Nominal exchange rate 1880–1947: Data supplied by James Lothian; 1948–95: *IFS*, series RF.

Long-term interest rate 1880–1965: Not available; 1966–95: Government bond yield, *IFS*, series 61.

Money stock growth 1880–1971: M1, data supplied by the Bank of Japan; 1972–95: Money, *IFS*, series 34B.

Monetary base growth 1880–1953: Banknote circulation, Mitchell (1991); 1954–95: Reserve money, *IFS*, series 14.

Central government expenditure and revenues 1880–1954: Mitchell (1991); 1955–93: *IFS*, series 82 and 81. (Note: Changes of definitions in 1955 and 1976.)

Central government debt 1880–1970: Calculated from K. Ohkawa and M. Shinohara (1979) *Patterns of Japanese Economic Development, A Quantitative Appraisal*, New Haven, Conn. and London: Yale University Press, table A46, pp. 376–8; 1971–4: Not available; 1975–1990: *IFS*, series 88a + 89a.

Netherlands

Population 1880–1988: Mitchell (1992); 1989–95: *IFS*, series 99Z.

Real national income growth 1880–1960: GDP, A. Maddison (1995) *Monitoring the World Economy 1820–1992*, OECD, table C-16a; 1961–95: GDP, *IFS*, series 99B.R.

Nominal national income 1880–99: Not available; 1900–47: NNP, Mitchell (1992); 1948–9: GDP, Mitchell (1992); 1950–95: GDP, *IFS*, series 99B.C.

Inflation 1880–1949: CPI, Mitchell (1992); 1950–95: CPI, *IFS*, series 64.

Nominal exchange rate 1880–1912: Not available; 1913–14: Data supplied by Marc Flandreau; 1915–47: International Monetary Fund; 1948–95: *IFS*, series RF.

Long-term interest rate 1880–1969: 2.5% Perpetual Debt of the Central Government, Homer and Sylla (1991), tables 28 and 64; 1970–95: Government bond yield, *IFS*, series 61.

Money stock growth 1880–1900: Currency, data supplied by Mr W. F. Vanthoor at De Nederlandsche Bank. 1901–71: M2, Central Bureau voor de Statistiek (1976) *75 Jaar Statistiek van Nederland*; 1972–95: Money, *IFS*, series 34.

Monetary base growth 1880–1948: Banknote circulation, total issues, Mitchell (1992); 1949–95: Reserve money, *IFS*, series 14.

Central government expenditure and revenues 1880–99: Not available; 1900–48: Mitchell (1992); 1949–95: *IFS*, series 82 and 81. (*Note*: change of definition in 1973).

Central government debt 1880–99: Not available; 1900–57: Central Bureau voor de Statistiek (1959) *Zestig jaar statistiek in tijdreeksen*, Voorburg; 1958–86: Central Bureau voor de Statistiek (1994) *Vijfennegentig jaar statistiek in tijdreeksen*, Voorburg; 1987–95: *IFS*, series 88A + 89A.

Norway

Population 1880–1988: Mitchell (1992); 1989–95: *IFS*, series 99Z.

Real national income growth 1880–1949: GDP, Mitchell (1992), except 1940–6: Data supplied by J. T. Klovland; 1950–95: GDP, *IFS*, series 99B.P.

Nominal national income 1880–1948: GDP, Mitchell (1992), except 1940–45: Constructed from data on real GDP and CPI; 1949–95: GDP, *IFS*, series 99B. (*Note*: Change of definition 1987.)

Inflation 1880–48: CPI, Statistisk sentralbyrå (1994) *Historisk statistikk 1994*, Oslo; 1949–95: CPI, *IFS*, series 64.

Nominal exchange rate 1880–98: Not available; 1899–1947: Annual Report of the Bank of Norway (various issues); 1948–95: *IFS*, series RF.

Long-term interest rate 1880–1975: Long-term bond yield (15 years), J. T. Klovland (1976) 'Obligationsrenten i Norge 1852–1976', *Statsøkonomisk Tidsskrift*, vol. 90; 1976–95: Government bond yield, *IFS*, series 61.

Money stock growth 1880–1971: M2, J. T. Klovland (1978) *Quantitative Studies in the Monetary History of Norway*, Ph.D. thesis, Bergen: Norwegian School of Economics and Business Administration; 1972–95: Broad money (M2), *IFS*, series 38N.

Monetary base growth 1880–1948: Banknote circulation, central bank issues, Mitchell (1992), except 1940–45: not available; 1949–95: Reserve money, *IFS*, series 14.

Central government expenditure and revenues 1880–1953: Mitchell (1992); 1954–94: *IFS*, series 82 and 81.

Central government debt 1880–1992: Statistisk centralbyrå (1994); (Note: Change of definition in 1972.)

Sweden

Population 1880–1988: Mitchell (1992); 1989–95: *IFS*, series 99Z.

Real national income growth 1880–1950: GDP, O. Krantz and C.A. Nilsson (1975) *Swedish National Product 1861–1970: New Aspects on Methods and Measurements*, Lund: C. W. K. Glerup/Liber Läromedel, tables 3.1 and 1 and 2, cols 2 and 4 (GDP at factor cost plus indirect taxes and customs duties deflated by the implicit GDP-deflator at factor cost); 1951–95: GDP, Statistics Sweden (1996), *Statistiska Meddelanden SM 9601 N10*, table 1.

Nominal national income 1880–1949: GDP, Krantz and Nilsson (1975), table 1.2, col. 2 and 4 (GDP at factor cost plus indirect taxes and customs duties); 1950–95: GDP, Statistics Sweden (1996), table 1.

Inflation 1880–1948: CPI, Statistiska Centralbyrån (1996), *Statistiska Meddelanden P15 SM9501*, p. 22; 1949–95: CPI, *IFS*, series 64.

Nominal exchange rate 1880–1947: Sveriges Riksbank, *Riksbankens årsbok* (various issues) (Annual Report of the Bank of Sweden); 1948–95: *IFS*, series RF.

Long-term interest rate 1880–1921: Effective average return on the total government debt, data supplied by SAF; 1922–47: Market yield on long-term government bonds, Homer and Sylla (1991), table 72; 1948–95: Government bond yield, *IFS*, series 61.

Money stock growth 1880–1971: Money stock (M2), L. Jonung (1975) *Studies in the Monetary History of Sweden*, Ph.D. thesis, Los Angeles: UCLA, Appendix A, table A-1, col. (5); 1972–95: Broad money (M3), *IFS*, series 38N.

Monetary base growth 1880–1948: Banknote circulation, central bank issues, Mitchell (1992); 1949–95: Reserve money, *IFS*, series 14.

Central government expenditure and revenues 1880: Not available; 1881–1947: Mitchell (1992); 1948–95: *IFS*, series 82 and 81. (Note: Change of definition in 1966.)

Central government debt 1880–1995: *Riksgäldskontorets årsbok* (various issues).

Switzerland

Population 1880–1988: Mitchell (1992); 1989–95: *IFS*, series 99Z.

Real national income growth 1880–1913: GDP, H. Ritzmann-Blickensdorfer (ed.) (1996) *Historical Statistics of Switzerland*, Zürich: Chronos-Verlag, henceforth *Historical Statistics* (1996), table Q.1a; 1914–29: Not available; 1930–48: NNP, Mitchell (1992); 1949–95: GDP, *IFS*, series 99B.R.

Nominal national income 1880–1913: GDP, *Historical Statistics*, (1996), table Q.1a. 1914–28: Constructed from CPI and interpolated data on real GDP; 1929–47: Chained NNP, Mitchell (1992); 1948–95: GDP, *IFS*, series 99B.C.

Inflation 1880–90: CPI, *Historical Statistics*, (1996) table Q.1a; 1891–1980: CPI, Federal Office of Statistics (1990) *Statistical Year Book of Switzerland*, Berne, table T5.7; 1981–95: CPI, *IFS*, series 64.

Nominal exchange rate 1880–1912: Not available; 1913–14: Data supplied by Marc Flandreau; 1915–47: International Monetary Fund; 1948–95: *IFS*, series RF.

Long-term interest rate 1880–1916: Mortgage bond yield (Taux d'intérêt pour obligations de caisse), *Historical Statistics* (1996) tables O.18b and O.18c; 1917–47: Government bond yield (Rendement d'obligation de la confederation), *Historical Statistics* (1996), table O.18c. 1948–95: Government bond yield, *IFS*, series 61.

Money stock growth 1880–1907: M1, *Historical Statistics*, (1996) table O.3; 1908–48: M3, *Historical Statistics* (1996), table O.4; 1949–95: Money plus quasi-money, *IFS*, series 35L.

Monetary base growth 1880–1948: Banknote circulation, total issues, Mitchell (1992); 1949–95: Reserve money, *IFS*, series 14.

Central government expenditure and revenues. 1880–1947: Mitchell (1992); 1948–95: *IFS*, series 82 and 81.

Central government debt 1880–1912: Not available; 1913–71: *Historical Statistics* (1996), table U.5; 1938–1959: Not available; 1972–95: *IFS*, series 88. (Note: Change of definition in 1972.)

United Kingdom

Population 1880–1965: C. Feinstein (1972), *National Income, Expenditure and Output of the United Kingdom 1855–1965*, Cambridge University Press, table 1, col. 13; 1966–95: *IFS*, series 99Z.

Real national income growth 1880–1948 GDP, B. R. Mitchell (1988) *British Historical Statistics*, Cambridge University Press, pp. 831–5; 1949–95: GDP, *IFS*, series 99B.R.

Nominal national income 1880–1947: GDP, Mitchell (1988), pp. 837–41; 1948–95: GDP, *IFS*, series 99B.C.

Inflation 1880–1948: Feinstein's retail price series, F. Capie and A. Webber (1985) *A Monetary History of the United Kingdom, Vol. 1*, London: George Allen & Unwin, table III, col. 12; 1949–95: CPI, *IFS*, series 64.

Nominal exchange rate 1880–1947: M. Friedman and A. J. Schwartz (1982) *Monetary Trends in the United States and the United Kingdom*, University of Chicago Press; 1948–95: *IFS*, series RF.

Long term interest rate 1880–1966: Rate of interest on consols (3%), D. K. Sheppard (1971) *The Growth and Role of U.K. Financial Institutions, 1880–1967*, London: Methuen table A.3.7, col. II; 1967–95: Government bond yield, long-term, *IFS*, series 61.

Money stock growth 1880–1966: Net money Supply (M2), Sheppard (1986), table A.3.3, col. 6; 1967–95: Money plus quasi-money, *IFS*, series 35L.

Monetary base growth 1880–1948: Banknote circulation, central bank issues, Mitchell (1992); 1949–95: Reserve money, *IFS*, series 14.

Central government expenditures and revenues 1880–1947: Mitchell (1992); 1948–95: *IFS*, series 82 and 81.

Central government debt 1880–1939: B. R. Mitchell with the collaboration of P. Deane (1962) *Abstract of British Historical Statistics*, London: Cambridge University Press, pp. 401–3; 1940–95: Central Statistical Office, *Annual Abstract of Statistics* (various issues), London.

United States of America

Population 1880–1957: US Department of Commerce, Bureau of the Census (1975) *Historical Statistics of the United States: Colonial Times to 1970*, Washington, DC, henceforth *Historical Statistics* (1975), series A6; 1958–95: *International Financial Statistics* on CD-ROM, henceforth *IFS*, series 99Z.

Real national income growth 1880–1948 GNP; N. S. Balke and R. J. Gordon (1986), Appendix B, Historical data in R. J. Gordon (ed.) *The American Business Cycle, Continuity and Change*, The University of Chicago Press, pp. 781–3; 1949–95: GDP, *IFS*, series 99B.R.

Nominal national income 1880–1947: GNP, Balke and Gordon (1986), pp. 781–3; 1948–95: GDP, *IFS*, series 99B.C.

Inflation 1880–1948: CPI, *Historical Statistics* (1975), series E135; 1949–95: CPI, *IFS*, series 64.

Nominal exchange rate 1880–1995: Unity by definition.

Long term interest rate 1880–1979: Basic yield on corporate bonds with 10 years to maturity, extension of Macauley's railroad bond rate, data supplied by NBER; 1980–95: Government bond yield, long-term, *IFS*, series 61.

Money stock growth 1880–1971: M2, Balke and Gordon (1986), pp. 784–6; 1972–95: Money plus quasi-money, *IFS*, series 35L.

Monetary base growth 1880–1948: Notes in circulation, B. R. Mitchell (1993) *International Historical Statistics: The Americas, 1750–1988*, New York: Stockton; 1949–95: Reserve money, *IFS*, series 14.

Central government expenditure and revenues 1880–1958: Mitchell (1993); 1959–95: *IFS*, series 82 and 81.

Central government debt 1880–1970: *Historical Statistics* (1975), series Y493; 1971–95: US Department of Commerce, Bureau of the Census (1996) *Statistical Abstract of the United States*, 116th edn., Washington, DC.

Notes

- 1 By incorporating expectations explicitly, a monetary regime differs from the older and more restricted concept of a monetary standard, which referred simply to the institutions and arrangements governing the money supply.
- 2 By convertibility, we mean the ability freely to convert the national currency into a fixed weight of specie. This differs from the concept of convertibility which developed after the breakdown of the classical gold standard in 1914 and was embedded in the 1944 Bretton Woods Agreement. In the latter sense, convertibility refers to the ability to exchange freely one national currency into another without exchange controls.
- 3 The distinction between convertible and inconvertible (fiat) regimes, and between fixed and moving nominal anchors, is related to the distinction between using the price level or the inflation rate as a target for monetary policy. Targeting the price level (Knut Wicksell's norm) in a fiat regime, as some have advocated, is not the same as targeting the price of specie, because of drift in the real price of specie. However, it does produce the same results as the convertible regime of long-run mean reversion of the price level and low long-run price level uncertainty. It does so at the expense of short-run price level variability and uncertainty, however, because the monetary authority has to deflate or inflate to correct past mistakes. In the face of nominal rigidities, this can lead to instability in real variables. Inflation targeting, on the other hand, by building base drift into the price level, leads to increasing price level uncertainty as the time horizon is extended. This cost must be weighed against the benefit of lower short-run price level and output instability. See Bordo and Schwartz (1999).
- 4 Sargent and Wallace (1981) argue that the monetary authority cannot prevent inflation in the case of an irresponsible fiscal authority which generates a continuous stream of primary budget deficits. Eventually they will be monetized. For counter-views, see McCallum (1997).
- 5 Recently, Woodford (1996) has argued that, under a special set of assumptions, bond-financed fiscal policy can be inflationary, holding money growth constant. McCallum (1997), however, argues that the assumptions required to produce this result are questionable.
- 6 In many developing countries with shallow financial markets and limited access to foreign capital, seigniorage is a much more important source of government finance. See Flood and Mussa (1994).
- 7 See note 2 above concerning the concept of 'convertibility'.

- 8 In recent years a number of prominent economists have argued that short-term interest rates are a better indicator of monetary policy than are monetary aggregates, because of the problem of variability in velocity induced by financial innovation. However, it is an indisputable fact that, to influence short-term rates, monetary authorities will have to operate on the monetary base (that is, carry out open market operations and rediscounting), hence our choice of the base as the primary measure of monetary policy (McCallum (1997)). It is also impossible to find a complete set of data for the short-term interest rates that the monetary authorities operated on over the 115 years and fourteen countries covered in this study.
- 9 We use total central bank note circulation to represent the base. This measure is inferior to a correct measure of the base, defined as currency held by the public plus commercial bank reserves (vault cash plus deposits with the central bank) adjusted for changing reserve requirements, but it is the only measure available across all countries and regimes.
- 10 To simplify the cross-country comparisons we ignore local and provincial (state) fiscal measures. This omission may be important, in particular for federal states such as the USA and Canada.
- 11 The traditional literature on fiscal policy makes an important distinction between discretionary policy and automatic stabilizers. The difference between the two is measured by the concept of full or high employment, or structural deficits or surplus. In this chapter we do not make this distinction because of the difficulties involved in measuring the structural deficit across time and countries.
- 12 Strictly speaking, until 1900 the gold standard period was a mixed one because a number of countries remained on silver (for example, Japan) or had inconvertible paper standards (for example, Spain). Moreover, the USA only joined the gold standard formally in 1900.
- 13 See, for example, Barro (1987, 1979), Bordo and White (1993), Sargent and Velde (1995) and Fregert and Jonung (1996) for studies of wartime financing through seigniorage.
- 14 Countries that were not able to maintain fiscal stability had great problems of adhering to the gold standard. This was the case with, *inter alia* Italy, Spain and Russia (Flandreau and le Cacheux (1997)).
- 15 In Norway and Sweden, debt denominated in foreign currencies was often around 80–90 per cent of total public debt.
- 16 See Barro (1979) for evidence showing a similar pattern for the UK and the USA all the way back to the eighteenth century.
- 17 In addition, the inflation rates show the highest degree of convergence between the fourteen countries during the classical gold standard.
- 18 A country such as Sweden used part of its export revenues to redeem the foreign debt that it had accrued to finance investments during the classical gold standard – one of the beneficial effects of neutrality.
- 19 Hyperinflations are closely associated with large budget deficits. Budgetary balance, often budgetary reform, was a necessary step to end hyperinflation after the First World War. See, for example, Sargent (1982).
- 20 See Ritschl (1996) for a comparison of the debt policies of France, Germany and the UK after the First World War.

- 21 Finland and Sweden make an interesting comparison. Both countries were facing the same dilemma: should they go back to the original gold parity rate of their currencies in the 1920s? Sweden settled for a return to the pre-1914 dollar rate, bringing about a deep depression, in fact deeper than during the 1930s. Finland, as a newly-established independent country, after fighting a war with Russia as well as a civil war, decided to go back to a fixed gold rate at the going rate, avoiding deflation and depression (Haavisto and Jonung (1995)).
- 22 The fatal flaws included the adjustment problem (asymmetric adjustment between deficit countries (Britain) and surplus countries (France and the USA); the failure by countries to follow the rules of the gold standard game, (for example both the USA and France sterilized gold flows); the liquidity problem (inadequate gold supplies, and the wholesale substitution of key currencies for gold as international reserves leading to a convertibility crisis when countries subsequently tried to convert the key currencies back into gold); and the confidence problem leading to sudden shifts among key currencies and between key currencies and gold (Eichengreen (1992), Bordo (1993b)).
- 23 See Jonung (1979) for an account of the Swedish fiscal and monetary programmes in the 1930s.
- 24 However, in the USA and other countries (for example Germany) M2 declined relative to the base, reflecting banking panics.
- 25 World-wide deflation in turn may reflect an overall gold shortage after the First World War, as argued by, for example, Gustav Cassel. See Eichengreen (1992).
- 26 The UK followed Keynes's prescription to finance the war to a large extent by taxes, whereas the USA and other countries followed classical tax-smoothing policies. According to Cooley and Ohanian (1997), this departure from optimal public finance doomed the UK to lower growth after the war than otherwise would have been the case.
- 27 See, for example, Bispham and Boltho (1982) on demand management policies in post Second World War Europe.
- 28 See, for example, Thygesen (1982) on monetary policies in Europe. To our knowledge, there is no comparative account of the conduct of monetary and fiscal policies for the OECD countries for the whole post-Second World War period.
- 29 There is so far no satisfactory explanation for this divergent pattern (Alesina and Perotti (1995)). For the case of Sweden, with one of the most volatile debt to income ratios among OECD countries, see Persson (1996).
- 30 Theoretical developments in recent years have complicated the simple distinction between fixed and floating exchange rates. In the presence of capital mobility, currency substitution, policy reactions and policy interdependence, floating rates do not necessarily provide complete insulation from either real or monetary shocks (Bordo and Schwartz (1989)). Moreover, according to recent real business-cycle approaches, there may be no relationship between the international monetary regime and the transmission of real shocks (Baxter and Stockman (1989)).
- 31 The dispersion of inflation rates between countries was lowest during the classical gold standard, and to a lesser extent during the Bretton Woods

- convertible subperiod, compared to the floating rate period and the mixed inter-war regime (Bordo (1993b)). This evidence is consistent with the traditional view of the operation of the classical price-specie-flow mechanism and commodity arbitrage under fixed rates and insulation, and greater monetary independence under floating rates.
- 32 Supporting evidence is provided in a recent study by Ghosh *et al.* (1996). Classifying the exchange rate systems for 136 countries over the period 1960–90 into pegged, intermediate, and floating, they adopt a methodology similar to that of Table 8.7. They use a nine-category classification scheme, distinguishing between different types of pegged and floating regimes. They find that the unconditional mean inflation rate for countries on pegged exchange rates was significantly lower than for those that did not peg. This result holds up, controlling for the 1960s, during which period most countries adhered to Bretton Woods. The only exceptions were high-income floating countries, which had lower than average inflation rates. Their results are unchanged when conditioned on a set of determinants of inflation, and when account is taken of possible endogeneity of the exchange-rate regime.
 - 33 The Bretton Woods regime also exhibited the lowest divergence of output variability among countries of any regime, with the inter-war regime being the highest. The greater convergence of output variability under Bretton Woods may reflect conformity between countries' business fluctuations, created by the operation of the fixed-exchange rate regime. It may also be because of the use of fiscal policies to counteract business fluctuations.
 - 34 In their 1960–90 sample, Ghosh *et al.* (1996) find little connection between adherence to a pegged exchange rate and growth, once the 1960s experience is taken into account. High-income floaters generally had more rapid growth than low-income floaters. There was little correlation between output volatility and the regime.
 - 35 For other arguments, see Bordo and Schwartz (1999).
 - 36 We do not consider the connection between unemployment and monetary and fiscal regimes for various reasons in this chapter. First, it is difficult to find data on unemployment for all countries for all periods. Second, we are of the opinion that the long-run patterns of unemployment rates are caused primarily by the structural features of the labour markets, not to regime performance *per se*.
 - 37 We do not consider here the characteristics of the business cycle, such as the amplitude of cyclical fluctuations under different regimes. This is an open issue. Much suggests, however, that the cyclical fluctuations were not significantly larger during the classical gold standard than during the post-Second World War period.
 - 38 Our results differ from those of Baxter and Stockman (1989), who find little difference between macroeconomic variables across regimes. The differences from our results reflects the use of different filters and econometric techniques.

References

- Abramovitz, Moses (1986) 'Catching Up, Forging Ahead, and Falling Behind', *Journal of Economic History*, vol. 46, no. 2, pp. 385–406.

- Alesina, Alberto and Roberto Perotti (1995) 'The Political Economy of Budget Deficits', *IMF Staff Papers*, vol. 42, no 1, pp. 1-30.
- Alogoskoufis, George S. and Ronald Smith (1991) 'The Phillips Curve, the Persistence of Inflation and the Lucas Critique: Evidence from Exchange-Rate Regimes', *American Economic Review*, vol. 81, no. 2, pp. 1254-73.
- Barro, Robert J. (1979) 'On the Determination of the Public Debt', *Journal of Political Economy*, vol. 87, pp. 940-71.
- Barro, Robert J. (1987) 'Government Spending, Interest Rates, Prices, and Budget Deficits in the United Kingdom, 1701-1918', *Journal of Monetary Economics*, vol. 20, pp. 221-48.
- Bayoumi, Tamim and Barry Eichengreen (1994) 'Economic Performance under Alternative Exchange Rate Regimes: Some Historical Evidence,' in Peter Kenen, Francesco Papadia, and Fabrizio Saccomani (eds), *The International Monetary System* (Cambridge University Press), pp. 257-97.
- Baxter, Marianne and Alan C. Stockman (1989) 'Business Cycles and the Exchange-Rate Regime: Some International Evidence,' *Journal of Monetary Economics*, vol. 23, pp. 377-400.
- Bispham, John and Andrea Boltho (1982) 'Demand Management', in Andrea Boltho (ed.), *The European Economy. Growth and Crisis* (Oxford University Press), pp. 289-328.
- Bordo, Michael D. (1984) 'The Gold Standard: The Traditional Approach', in Michael D. Bordo and Anna J. Schwartz (eds), *A Retrospective on the Classical Gold Standard, 1821-1931* (Chicago: University of Chicago Press), pp. 23-113.
- Bordo, Michael D. (1993a) 'The Bretton Woods International Monetary System. An Historical Overview', in Michael D. Bordo and Barry Eichengreen (eds), *A Retrospective on the Bretton Woods System: Lessons for International Monetary Reform* (University of Chicago Press), pp. 3-98.
- Bordo, Michael D. (1993b) 'The Gold Standard, Bretton Woods and Other Monetary Regimes: An Historical Appraisal', in *Dimensions of Monetary Policy: Essays in Honor of Anatole B. Balbach. Federal Reserve Bank of St. Louis Review*, Special Issue, April-May, pp. 123-91.
- Bordo, Michael D. and Lars Jonung (1996) 'Monetary Regimes, Inflation and Monetary Reform', in Daniel Vaz and Kumarasvamy Velupillai (eds), *Inflation, Institutions and Information, Essays in Honour of Axel Leijonhufvud* (London: Macmillan - now Palgrave), pp. 157-244.
- Bordo, Michael D. and Lars Jonung (1997) 'The History of Monetary Regimes Including Monetary Unions. Some Lessons for Sweden and EMU', *Swedish Economic Policy Review*, vol. 4, pp. 285-358.
- Bordo, Michael D. and Finn E. Kydland (1996) 'The Gold Standard as a Commitment Mechanism', in Tamim Bayoumi, Barry Eichengreen and Mark Taylor (eds), *Modern Perspectives on the Gold Standard* (Cambridge University Press), pp. 55-100.
- Bordo, Michael D. and Ronald MacDonald (1997) 'Violations of the "Rules of the Game" and the Credibility of the Classical Gold Standard, 1880-1914', NBER Working Paper No. 6615, July.
- Bordo, Michael D. and Hugh Rockoff (1996) 'The Gold Standard as a "Good Housekeeping Seal of Approval"', *Journal of Economic History*, vol. 56, no. 2, pp. 384-428.
- Bordo, Michael D. and Anna J. Schwartz (1989) 'Transmission of Real and Monetary Disturbances under Fixed and Floating Rates', in James A. Dorn and William A. Niskanen (eds), *Dollars, Deficits and Trade* (Boston, Mass: Kluwer), pp. 237-58.

- Bordo, Michael D. and Anna J. Schwartz (1996) 'Why Clashes between Internal and External Stability Goals End in Currency Crises, 1797-1994', *Open Economies Review*, vol. 7, Supplement no. 1, pp. 437-68.
- Bordo, Michael D. and Anna Schwartz (1999) 'Monetary Policy Regimes and Economic Performance: The Historical Record', in John Taylor and Michael Woodford (eds), *Handbook of Macroeconomics* (Amsterdam and New York: North-Holland), pp. 149-234.
- Bordo, Michael D. and Eugene White (1993) 'British and French Finance during the Napoleonic Wars', in Michael D. Bordo and Forrest Capie (eds), *Monetary Regimes in Transition* (Cambridge University Press), pp. 241-73
- Cooley, Thomas and Lee Ohanian (1997) 'Postwar British Economic Growth and the Legacy of Keynes', *Journal of Political Economy*, vol. 105, pp. 439-72.
- DeLong, Bradford J. (1998) 'Fiscal Policy in the Shadow of the Great Depression', in Michael D. Bordo, Claudia Goldin and Eugene N. White (eds), *The Defining Moment: The Great Depression and the American Economy in the Twentieth Century* (University of Chicago Press), pp. 67-85.
- Eichengreen, Barry (1992) *Golden Fetters: The Gold Standard and the Great Depression, 1919-1939* (Oxford University Press).
- Eichengreen, Barry (1993) 'Three Perspectives on the Bretton Woods System', in Michael D. Bordo and Barry Eichengreen (eds), *A Retrospective on the Bretton Woods System* (Chicago: University of Chicago Press and NBER), pp. 621-57.
- Eichengreen, Barry (1996) *Globalizing Capital: A History of the International Monetary System* (Princeton, NJ: Princeton University Press).
- Flandreau, Marc and Jacques le Cacheux (1997) 'Central Bank Independence and Market Discipline Under the European Gold Standard 1880-1914', Mimeo, OEFCE, Paris.
- Flood, Robert P. and Michael Mussa (1994) 'Issues Concerning Nominal Anchors for Monetary Policy', in Tomas J. T. Balino and Carlo Cottarelli (eds), *Framework for Monetary Stability: Policy Issues and Country Experiences* (Washington, DC: International Monetary Fund), pp. 42-77.
- Fregert, Klas and Lars Jonung (1996) 'Inflation and Switches between Specie and Paper Standards in Sweden 1668-1931: A Public Finance Interpretation', *Scottish Journal of Political Economy*, vol. 43, pp. 444-67.
- Ghosh, Atish R., Anne Marie Gulde, Jonathan D. Ostry and Holger Wolf (1996) 'Does the Nominal Exchange Rate Regime Matter- IMF Working Paper No. 121, November.
- Giovannini, Alberto (1993) 'Bretton Woods and its Precursors: Rules versus Discretion in the History of International Monetary Regimes', in Michael D. Bordo and Barry Eichengreen (eds), *A Retrospective on the Bretton Woods System: Lessons for International Monetary Reform* (University of Chicago Press), pp. 109-54.
- Grossman, Herschel J. (1990) 'The Political Economy of War Debts and Inflation', in W.S. Haraf and Phillip Cagan (eds), *Monetary Policy for a Changing Financial Environment* (Washington, DC: American Enterprise Institute), pp. 166-80.
- Haavisto, Tarmo and Lars Jonung (1995) 'Off Gold and Back Again. Finnish and Swedish Monetary Policies 1914-1924', in Charles Feinstein (ed.), *Banking, Currency and Finance in Europe between the Wars* (Oxford University Press), pp. 237-66.
- Jonung, Lars (1979) 'Knut Wicksell's Norm of Price Stabilization and Swedish Monetary Policy in the 1930s', *Journal of Monetary Economics*, vol. 5, pp. 439-72.

- Laidler, David (1991) *The Golden Age of the Quantity Theory. The Development of Neoclassical Monetary Economics 1870–1914* (New York: Harvester).
- Leijonhufvud, Axel (1984) 'Constitutional Constraints on the Monetary Power of Government', in Richard B. McKenzie (ed.), *Constitutional Economics* (Lexington, Mass: Lexington Books), pp. 95–107.
- Klein, Benjamin (1975) 'Our New Monetary Standard: Measurement and Effects of Price Uncertainty, 1880–1973', *Economic Inquiry*, vol. 13, pp. 461–84.
- Kydland, Finn E. and Edward Prescott (1977) 'Rules Rather than Discretion: The Inconsistency of Optimal Plans', *Journal of Political Economy*, vol. 85, pp. 473–91.
- McCallum, Bennett T. (1997) 'Issues in the Design of Monetary Policy Rules', NBER Working Paper, no. 6016, April.
- McKinnon, Ronald I. (1988) 'An International Gold Standard without Gold', *Cato Journal*, vol. 8, pp. 351–73.
- Persson, Mats (1996) 'Swedish Government Debts and Deficits, 1970–1995', *Swedish Economic Policy Review*, vol. 3, no 1 pp. 21–60, Spring.
- Redish, Angela (1993) 'Anchors Aweigh: The Transition from Commodity Money to Fiat Money in Western Economics', *Canadian Journal of Economics*, vol. 26, no. 4, pp. 777–95.
- Ritschl, Albrecht (1996) 'Sustainability of High Public Debt: What the Historical Record Shows', *Swedish Economic Policy Review*, vol. 3, no.1, pp. 175–98.
- Sargent, Thomas J. (1982) 'The End of Four Big Inflations', in Robert E. Hall (ed.), *Inflation* (Chicago: Chicago University Press and NBER).
- Sargent, Thomas J. and François R. Velde (1995) 'Macroeconomic Features of the French Revolution', *Journal of Political Economy*, vol. 103, no. 3, pp. 474–518.
- Sargent, Thomas J. and Neil Wallace (1981) 'Some Unpleasant Monetarist Arithmetic', *Federal Reserve Bank of Minneapolis Quarterly Review*, vol. 5, pp.1–7.
- Thygesen, Niels (1982) 'Monetary Policy', in Andrea Boltho (ed.), *The European Economy. Growth and Crisis* (Oxford University Press), ch. 11.
- Toma, Mark (1997) *Competition and Monopoly in the Federal Reserve System* (Cambridge University Press).
- Woodford, Michael (1995) 'Price-level Determinacy without Control of a Monetary Aggregate', *Carnegie–Rochester Conference Series on Public Policy*, pp. 1–46.
- Woodford, Michael (1996) 'Loan Commitments and Optimal Monetary Policy', *Journal of Monetary Economics*, vol. 37, pp. 573–606.

Comment

Giorgio Fodor

University of Trento, Italy

This chapter presents an impressive wealth of data, painstakingly collected, to discuss an important and rarely analyzed problem: the connection between monetary and fiscal regimes. Data for fourteen countries, for a period of over a century, are synthesized and aggregated according to the prevailing monetary regime: classical gold standard 1881–1913, the First World War, inter-war, the Second World War, Bretton Woods 1947–71, and floating exchange rates 1973–94. Some of these periods are in their turn subdivided into subperiods: the most important ones are the division of the Bretton Woods system into two distinct phases: preconvertible 1947–58, and convertible 1959–71; and the split of the later regime between high inflation 1973–82 and low inflation 1983–95. For each period we are given information about monetary and fiscal policy as well as on the price level, interest rates, exchange rates and real income, and in the conclusions are presented with a comparison of how the different periods performed. The authors' basic questions about the interrelations between monetary and fiscal regimes will undoubtedly be pursued by other scholars, who will exploit with gratitude the main ideas contained in this chapter and the wealth of data it contains.

It is not easy to comment because it is clear that the authors are perfectly aware of most objections that could be raised on some of their positions. They subtly qualify many of their assertions, although in the end they do sometimes present views that are more definite than a careful reader of their text might expect. This may be the inevitable consequence of trying to extract clear-cut conclusions from such varied experiences as the ones analyzed here; fortunately, it also leaves space for the commentator to point to those aspects and exceptions that do not fit easily into the general picture presented.

The chapter starts with a discussion of monetary and fiscal regimes, and their interrelations, stressing that a regime in which money is convertible into specie is incompatible with an activist fiscal policy. They state that, during the gold standard, in the main countries, public debt was created during wars and gradually repaid in peacetime, or at least stabilized; in this way the debt/GNP ratio fell over time. Although this was true of the UK and the USA, the experiences of many other countries was different and this did not endanger the link with gold. In Germany, for example, total public debt increased rapidly: it was RM6324 million in 1880-1, RM11,948 million in 1890-91; RM16,398 million in 1900-1 and RM32,843 in 1913-14 (Deutsche Bundesbank (1976), p. 313). In France, between 1880 and 1913 it increased by about 50 per cent (INSEE (1966), p. 494) while in Canada it more than doubled (Urquhart (1965), p. 204¹). I mention this point because expectations do not seem to have been unsettled by this growth in public debt in some important countries. With regard to convertibility into gold, it should also be noticed here that the experiences of the various countries were very heterogeneous. For some important countries there was no legal obligation to convert their currency into gold, but they did so in any case because they adhered to the conventions and beliefs of the times. This was true in particular for such a key country as France, a country that more than once came to the rescue of convertibility in the UK before the First World War. In France, banknotes could be legally repaid in five-franc silver coins, with a low market value because of the depreciation of silver; furthermore, the Bank of France was under no legal obligation to buy gold at a fixed price (National Monetary Commission (1910), p. 218)). In Germany the silver taler could have posed similar problems until 1907, and in many other countries the *legal* obligations usually attached to the gold standard were either not clear-cut or non-existent. Still, for core countries, the gold points were usually effective and exchange rates extremely stable.

What should be noticed is that the authors' generalizations are true for the key country (the UK, where debt was reduced and strict legal provisions on gold convertibility), and this appears to have been enough to determine many characteristics of the whole system. A more general point is the idea that, at the heart of their discussions on specie-convertible regimes, such a 'standard ensures that price levels will return to some mean value over long periods of time, provided that the relative price of specie remains constant'. Now this is certainly true; the problem is that the relative price of specie did not remain constant. The discussions in the USA in the 1930s on subjects such as the monetary consequences of a 'brick standard' (Buchanan (1962), p. 173)) were a useful intellectual

exercise to underline how difficult it was to have stable prices with convertibility into any commodity. That commodity had to possess qualities which gold did not seem to possess any more. This is what made the gold standard in some periods vulnerable to charges that it implied monetary instability. Most monetary plans of the 1920s tried to deal with this question. Some tried to control the supply of gold, as in the proposal for international control of South African gold mines to regularize their output. Others tried to control monetary demand. The introduction of the gold exchange standard proposed in the Genoa Conference in 1922 was seen as a possible remedy to a terribly urgent problem.² The search was on to find a monetary regime that would help to keep the price level more stable than under the pure gold standard. Commodity prices of US exports had halved after the brief post-war boom (and would halve again after 1929) while the dollar continued to have the same gold value. Convertibility into gold was seen as no tool for stable prices. This is how the idea of managed money became attractive: it was seen as a way to obtain what the gold standard did not give: price stability. When our authors say that 'in many ways the advent of inflation targeting has great similarities with the gold standard period', they seem to underestimate how unstable a convertibility regime could be. It was not convertibility into gold that determined stable prices. It was certainly not a sufficient condition, as the experience of the USA was to confirm later, when the price of gold remained fixed at US \$35 while prices more than doubled in the 1940s and continued to rise later.

One last point on the gold standard: to use total central banknote circulation may be inevitable given the data available, but it has very serious limitations which should be made explicit. In the UK the minimum value of banknotes was £5, well above the monthly income of many people. According to the US Mint, out of a total per capita quantity of money of US\$20.80, only US \$2.84 was in banknotes, with the rest held in gold and silver. For France, the figures are even more extreme: total money equivalent of US \$35.47 and banknotes US \$2.55. These figures have very serious drawbacks, but are indicative of the importance of the various mints. We should also not forget Robert Triffin's insistence on the importance of the rapid expansion and consolidation of joint stock banks which allowed a much faster expansion of M1.

I also raise two points on the Bretton Woods period. The authors give much importance to the convertibility of the dollar into gold. I do not think that it is easy to prove its importance as a restraining factor in the post-war period. In the numerous hearings on the Federal Reserve held in the 1950s, maintaining convertibility into gold does not seem to have

been important. What was asked of the monetary authorities in the early post-Second World War period was to ensure financial stability, until the late 1950s the objective was price stability and from the Sputnik onwards, economic growth. The Report of the Commission on Money and Credit reflects the general mood when it identifies three objectives for economic policy: reasonable price stability, low unemployment and adequate economic development. On the Bretton Woods period, the authors heap much blame on activist Keynesian policies. Referring to the mid-1960s, they assert 'at the same time European countries began following Keynesian full employment policies'. Full employment policies started much earlier in Europe, in particular in the UK, the Netherlands and Sweden. In the British case, Keynesian policies and full use of the fiscal instrument were compatible with internal financial stability and reasonable growth. But by shifting forward by some twenty years the time of when these policies were followed, the reader is left with the impression that they resulted in an immediate deterioration of the economic situation. They write similarly of the USA: 'For the USA, activist Keynesian policies were a product of the late 1960s and 1970s.' Arthur Burns, Richard Nixon and Gerald Ford would have been surprised by this statement.

The chapter gives the impression that, once the gold chain was broken, governments finally indulged in full employment policies, with devastating inflationary consequences. But unemployment was much higher in the 1970s than the 1960s: for the seven main OECD countries it doubled between 1968 and 1975. Fiscal deficits increased because governments tried to mitigate a recession not because, finally free, they pursued full employment policies. It should also be remembered that the IMF invited industrial countries to avoid a world deflationary spiral initiated by the sudden surplus in the balance of payments of oil-exporting countries with a low capacity to import in the short run. With the collapse of Bretton Woods, many European countries, far from finally feeling free from an unwanted constraint, tried desperately to reconstruct a fixed exchange regime. It is therefore not obvious why the authors, who have interesting things to say about the European monetary system, are so definite in classifying the period 1973-94 as one of floating exchange rates. For the EMS countries in their sample it could be argued that it was nearer to a system of fixed exchange rates.

While the idea of monetary regimes has proved to be extremely fruitful, the authors are aware that an exclusive concentration on the issue of convertibility versus fiat money is too rigid a straitjacket when comparing different periods. They therefore, unexpectedly, sometimes use a totally different approach which emphasizes the role played by the key country

in each system (the UK during the gold standard, the USA during Bretton Woods, and Germany for Europe during the recent low inflation period). This approach has a long tradition (Keynes, William Adams Brown, Prebisch, John B. Williams and, in more recent years, Kindleberger and de Cecco) that may in the future lead the authors to take a further step and try to explain why the centre country adheres to a particular monetary regime, and in what conditions this can be maintained. The convertibility regimes evolved rapidly, and, as our authors are perfectly aware, the gold standard had already become a gold exchange standard before 1914, while the Bretton Woods system changed dramatically in the 1960s. With the Gold Pool, other countries supplied half the gold necessary to keep the market price of gold stable in terms of dollars, while demanding gold for dollars was considered to be a hostile act, as the experiences with Charles de Gaulle showed.

The chapter takes a very drastic stand on unemployment ('we are of the opinion that the long-run patterns of unemployment are primarily because of the structural features of the labour markets, not to regime performance *per se*'). But if monetary regimes influence expectations about interest rates and their variability (as any South American would now readily acknowledge) this refusal even to consider a possible relationship between the monetary regime and unemployment is surprising. The role of growth is also sometimes left in the background. This is the case in particular when discussing an indicator such as the debt/GNP ratio. A certain budget deficit/GNP ratio may lead to an unsustainable situation in a low-growth context, while it is perfectly sustainable with high growth. For countries such as France, the rising debt/GNP ratio in the 1990s does not reflect lax fiscal policies but lower rates of growth.

The chapter is quite sceptical about the positive influence of the Bretton Woods system on the rate of economic growth. Although these conclusions are partly based on previous work (Bordo and Schwartz (1999)), I believe that it would be most useful if in the future the authors could complement this work with a similar one sharply focused on the relationship between the fiscal and monetary regimes, and employment and growth. But why do we have periods in which both financial and monetary policies are stricter than in others? Keynes, at the beginning of the First World War, raised the problem half-jokingly: 'Men are born of two kinds (except in South America, where all are of the second), mercantilists and inflationists – those who believe that a sufficiency of solid gold is a cure for all financial ills, and those who believe that a sufficiency of cheap credit and paper money will promote unlimited

prosperity for us. Each school in turn influences the conduct of affairs' (Keynes (1914), p. 325). Both William Gladstone and Margaret Thatcher were opposed to fiscal deficits, and neither needed the constraints of a convertible monetary regime to prevent them from following an inflationary policy. President Perón, on the other hand, complained in a radio speech that one could not walk easily in the corridors of the Argentine central bank because there was too much useless gold.

Growth and employment have been viewed by both voters and policymakers as being linked to the monetary regime, especially when things go wrong. And they may explain why, in some periods, a regime that seemed perfectly acceptable suddenly is seen as an intolerable straitjacket. I think we all agree with the reasonable words of the President of the Federal Reserve Bank of New York: 'in my view, a key principle of monetary policy is that price stability is a means to an end – to promote sustainable economic growth' (McDonough (1997), p. 2). When growth is elusive, the search for alternative monetary and fiscal policies begins.

Notes

- 1 For France, *dette perpetuelle et à terme*; if *dette viagère* (pensions) had been included, the expansion would have been higher. For Canada, unmatured debt less sinking fund.
- 2 'The purpose of the convention would be to centralize and co-ordinate the demand for gold, and so to avoid those wide fluctuations in the purchasing power of gold, that might otherwise result from the simultaneous and competitive efforts of a number of countries to secure metallic reserves' – from Article 36 of the London Experts' Report, incorporated in Resolution 9 of the Report of the Second Commission (Finance) (United Kingdom (1924), pp. 18 and 61).

References

- Bordo, M. D. and A. J. Schwartz, (1999) 'Monetary Policy Regimes and Economic Performance: The Historical Record', in J. Taylor and M. Woodford (eds), *Handbook of Macroeconomics* (Amsterdam: North-Holland), pp. 149–234.
- Buchanan, J. M. (1962) 'Predictability: The Criterion of Monetary Constitutions', in L. B. Yeager (ed.), *In Search of a Monetary Constitution* (Cambridge, Mass.: Harvard University Press), pp. 155–83.
- Deutsche Bundesbank (1976) *Deutsches Geld- und Bankwesen in Zahlen 1876–1975* (Frankfurt am Main: Fritz Knapp).
- HMSO (1924) *Papers Relating to International Economic Conference, Genoa, April–May 1922*, Cmd. 1667 (London: HMSO).
- INSEE (1966) *Annuaire statistique de la France* (Paris: INSEE).
- Keynes, J. M. (1914) 'The Prospects of Money, November 1914', *Economic Journal*, December 1914; reprinted in *Collected Writings*, vol. XI (London: Royal Economic Society).

- McDonough, W. C. (1997) 'A Framework for the Pursuit of Price Stability', in Federal Reserve Bank of New York, *Economic Policy Review*, August, pp. 1-7.
- National Monetary Commission (1910) *Interviews on the Banking and Currency Systems of England, Scotland, France, Germany, Switzerland and Italy* (Washington, DC: Government Printing Office).
- Urquhart, M. C. (ed.) (1965) *Historical Statistics of Canada* (Cambridge University Press).

Monetary Theory and Policy Experience

Edited by

Axel Leijonhufvud
University of Trento

palgrave

in association with
International Economic Association

Contents

<i>The International Economic Association</i>	vii
<i>Acknowledgements</i>	ix
<i>List of Contributors</i>	x
<i>List of Abbreviations and Acronyms</i>	xii
<i>Introduction by Axel Leijonhufvud</i>	xiv

Part I Central Banking Experience

1 Putting Central Banks in Their Place <i>John W. Crow</i>	3
2 Monetary Theory as a Basis for Monetary Policy: Reflections of a Central Banker <i>Otmar Issing</i> Comment <i>Luigi Pasinetti</i> Comment <i>Luigi Spaventa</i>	13 25 28
3 Monetary Policy and Economic Performance: the Recent Experience of the United States and Japan <i>Kumiharu Shigehara</i>	36
4 What Have Monetary Economists done for Central Bankers? The Argentine Case <i>Pedro Pou</i>	66

Part II The 'Modus Operandi' of Monetary Policy

5 Inflation and/or Exchange-rate Targets for Monetary Policy? <i>Niels Thygesen</i> Comment <i>Roberto Tamborini</i>	97 114
6 The Choice of a Monetary Policy Reaction Function in a Simple Optimizing Model <i>Dale W. Henderson and Jinill Kim</i>	122

Comment	169
<i>Luigi Bonatti</i>	
Comment	173
<i>Francesco Farina</i>	
Part III Monetary Regimes	
7 The New Political Economy of Central Banking	181
<i>Sylvester C.W. Eijffinger</i>	
Comment	210
<i>Carluccio Bianchi</i>	
Comment	220
<i>Mustapha K. Nabli</i>	
8 A Return to the Convertibility Principle? Monetary and Fiscal Regimes in Historical Perspective: The International Evidence	225
<i>Michael D. Bordo and Lars Jonung</i>	
Comment	284
<i>Giorgio Fodor</i>	
9 Money and the Sovereignty of the State	291
<i>Robert A. Mundell</i>	
Comment	338
<i>Daniel Heymann</i>	
<i>Index of Names</i>	343
<i>Subject Index</i>	348