Journal of International Economics 77 (2009) 195–205

Contents lists available at ScienceDirect

Journal of International Economics

journal homepage: www.elsevier.com/locate/jie

Stuck on gold: Real exchange rate volatility and the rise and fall of the gold standard, 1875–1939☆

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ARTICLE INFO

Article history:
Received 5 December 2006
Received in revised form 24 November 2008
Accepted 6 January 2009

Keywords:
Nominal rigidity
Exchange-rate regime
Terms-of-trade shocks
Optimal monetary policy

JEL classification:
F33
F41
N10

ABSTRACT

Did the gold standard diminish macroeconomic volatility? Supporters thought so, critics thought not, and theory offers ambiguous messages. Hard regimes like the gold standard limit monetary shocks by tying policymakers' hands; but exchange-rate inflexibility compromises shock absorption in a world of real disturbances and nominal stickiness. A model shows how lack of flexibility affects the transmission of terms-of-trade shocks. Evidence from the late nineteenth and early twentieth century exposes a dramatic change. The classical gold standard did absorb shocks, but the interwar gold standard did not, supporting the view that the interwar gold standard was a poor regime choice.

1. Introduction

An assumption of structural change in the macroeconomy stands at the heart of some of the most influential narratives of the economic history of the early twentieth century. Massive transformations in political economy and macroeconomic policy supposedly derived from an increasing degree of inflexibility. By the late 1920s these rigidities left economies vulnerable to economic shocks under a fixed exchange-rate regime. Despite a prevailing gold standard *mentalité*, democratic pressures encouraged policymakers to react and experiment with new macroeconomic policies, provided they could break free of their ideological fetters (Polanyi 1944; Temin 1989; Eichengreen 1992; Eichengreen and Temin 2000).

Still, evidence for these kinds of structural changes is largely fragmentary and unsystematic, with samples limited by country or time period, leaving the conventional view short of support and open to criticism. This paper re-examines the question using a much larger panel dataset covering both the prewar and interwar periods. Using exogenous terms of trade shocks to obtain identification, we find signs of a structural change in open economy macroeconomic dynamics between the classical and interwar gold standard period, one consistent with rising nominal rigidities.

These questions are of more than antiquarian interest. The optimal choice of an exchange rate regime remains one of the most durable problems in international macroeconomics. The essential tradeoff facing policy makers then and now was highlighted by the Mundell–Fleming model and is central to all New Open Economy Macroeconomic (NOEM) models. On the one hand, hard pegs can provide the economy with a nominal anchor. On the other hand, a flexible exchange rate can act as a shock absorber to buffer the economy from external shocks in the presence of nominal rigidities (Obstfeld and Rogoff, 1996).

A clear illustration of how stickiness interacts with a fixed-versus-floating choice is provided in the simple classical model of Reinhart, Rogoff, and Spilimbergo (2003). We extend this approach, and it is one we think quite suited for historical analysis. Indeed, history more

☆ We thank Michael Bordo, Paul Bergin, Christopher Hanes, John James, Maurice Obstfeld, Kevin O'Rourke, the editor and two anonymous referees for helpful suggestions. The usual disclaimer applies. Jacks gratefully acknowledges the Social Sciences and Humanities Research Council of Canada for research support. Taylor gratefully acknowledges the Center for the Evolution of the Global Economy, UC Davis, for research support.

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doi:10.1016/j.jinteco.2009.01.003

closely resembles this stylized model than does the present. Current debate ranges over the merits of hard pegs, currency boards, and dollarization at one extreme, via adjustable pegs, crawling pegs, and dirty floats, to the idealized notion of the pure float. The debate is further complicated by the extent to which countries that claim to float actually fix and by the claim that any regime other than the "corner solutions" of hard peg or pure float is unsustainable.[1] Fortunately, the past can more justifiably be reduced to the textbook fixed-floating dichotomy. Debate over exchange rate regimes a century ago was comparatively simple: to a first approximation, countries were either on the gold standard or they were floating. To be sure, there were a few vestiges of bimetallism or silver standards, but the gold standard countries by 1913 accounted for approximately 48% of countries, 67% of world GDP, and 70% of world trade.[2]

Gold had emerged as the dominant monetary regime of its time and as a robust nominal anchor. Why? The claim was made that it helped to promote international trade and investment, and the data now back it up.[3] Small wonder, then, that after the violent disruptions of World War One the world anchored again to gold in the 1920s. Unfortunately, despite its past record for stability, the reconstituted gold standard failed; it is now generally thought to have exacerbated volatility and contributed substantially to the Great Depression (Kindleberger 1973; Temin 1989; Eichengreen 1992). One measure of this increased instability that we will study in this paper is the extent of real exchange rate volatility in the world economy.

Why did an institution that had worked so well for decades become, in the 1920s, "unsafe for use" (Temin 1989, p. 10)? And what can history teach us about the present?

In this paper we study theoretically and empirically the performance of the gold standard as a shock absorber, and find that the regime performed very differently at different times. The classical gold standard did not exacerbate real exchange rate volatility and coped well with terms-of-trade shocks. The interwar gold standard did not absorb these shocks so well, at a time when these shocks turned out to be quite large, and made real exchange rate volatility worse.

2. Conventional wisdom

As we discuss below, if one wishes to claim that a fixed exchange-rate system such as the gold standard is an optimal monetary arrangement, one has to invoke an assumption of nominal (price–wage) flexibility—an assumption that underpins perhaps the most conventional explanation for why the prewar gold standard worked while the interwar gold standard failed. In this view, the gold standard was compromised as the flexibility assumed by the classical economists gave way to the stickiness emphasized by the Keynesians. But what evidence can be adduced in favor of this view? Although it is widely believed, this explanation suffers from a lack of quantitative support and studies are rare except in a handful of countries. Our paper is an attempt at a comparative analysis that looks at structural changes in the world economy in many countries both before and after World War One. We briefly discuss some of the related literature.

Several authors have noted the tendency for nominal rigidities to increase over time in developed economies, even before the twentieth century. For example, in the United States, Hanes and James (2003) find no evidence of downward nominal wage rigidity in the mid-nineteenth century. But there is evidence of some manufacturing wage rigidity beginning in the late nineteenth century, which appears to have persisted into the twentieth century; this change may have been related to changes in labor's bargaining power and was especially strong in firms that paid high wages, had high capital intensity, or were in highly concentrated industries (Gordon 1990; Allen 1992; Hanes 1993, 2000). As the structural transformation out of agriculture and into manufacturing progressed, as capital intensification proceeded in industry, and as labor's power expanded, these trends could promote greater stickiness in the economy as a whole. As long as these nominal rigidities remained minor before 1914, they would have posed less of a problem for the classical gold standard adjustment than for its interwar successor.

What about evidence from other countries? In a study using panel data for a range of countries, Basu and Taylor (1999) found a mild increase in the cyclicality of interwar real wages, as compared to other historical periods, which is consistent with the Keynesian hypothesis.[4] Bordo, Erceg, and Evans (2000) attribute part of the severity of the U.S. Great Depression to previously absent nominal rigidities. In a study of the U.S., U.K., and Germany, Bordo, Lane, and Redish (2008) find evidence that deflation was not as damaging before World War One as in the interwar period, and they suggest that a nearly vertical aggregate supply curve had become positively sloped by the 1920s as a result of increased nominal rigidities.

Of course, these studies are by no means exhaustive or definitive when it comes to assessing the evolution of macroeconomic rigidities worldwide and further research is necessary to assess the heterogeneous experiences of countries. There is also the further problem that data quality suffers the further back in time we go; for example, the definition of U.S. and U.K. consumer price indices changes substantially after World War One, an artifact that could bias the results in the literature. These and other issues still await resolution, and must also be borne in mind for the present paper.[5]

Nonetheless, according to the fragmentary evidence provided by previous studies, it appears that nominal rigidities were perhaps not entirely absent in the world economy of the late nineteenth century. But they were on the rise, and almost certainly a factor in the Great Depression where nominal wages did not fall as rapidly as prices, an observation clearly at odds with a classical flexible-price model. Indeed, the non-neutral expansionary effect of devaluations in the setting of the 1930s has been shown for a wide range of countries (Eichengreen and Sachs 1985; Campa 1990; Bernanke and Carey 1996; Obstfeld and Taylor 2004).

An increase in nominal rigidity could offer a reason to expect the interwar period to be subject to much more turbulent adjustment in the face of shocks. This ought to be manifest in many of the economy's vital signs, but our benchmark open-economy macroeconomic model would suggest that the first place to look for symptoms would be in the behavior of the real exchange rate. A major goal of this paper is to document empirically the extent to which real exchange rate behavior shifted as the world economy moved from the classical to the interwar gold standard. We now present a theoretical structure that informs our empirical design.

[1] On the merits of hard pegs, see, e.g., Calvo and Reinhart (2001) and Dornbusch (2001). On the fragility of pegs see Obstfeld and Rogoff (1995). On the debate over "corner solutions" see Fischer (2001), Frankel (1999). On misleading exchange rate regime classifications see Reinhart and Rogoff (2004), Shambaugh (2004), and Levy-Yeyati and Sturzenegger (2005). On why developing countries have a "fear of floating" see Calvo and Reinhart (2002). On flexible exchange rates as shock absorbers see Edwards and Levy-Yeyati (2005).

[2] Figures derived from Alesina, Spolaore, and Wacziarg (2000), Maddison (1995), and Meissner (2005), respectively. On the evolution of exchange rate regimes in the late nineteenth century, and particularly the gold standard, see Eichengreen (1996), Gallarotti (1995), and Meissner (2005).

[3] On the gold standard and trade see Estevadeordal, Frantz, and Taylor (2003), Flandreau and Maurel (2005), Jacks (2006), and López-Córdova and Meissner (2003). On the gold standard and bond spreads see Bordo and Rockoff (1996) and Obstfeld and Taylor (2003).

[4] However, as Hanes (1996) notes, controlling for the long run changes in the composition of the CPI, real wage cyclicality has been quite stable, and long-run comparisons need to allow for the greater countercyclicality of price markups on more finished goods.

[5] Though not central to this paper, there is also the related question as to whether the rigidities that supposedly characterized the interwar period persisted even longer—for the U.S. and U.K., at least, the evidence suggests not (Phillips, 1958; Hanes, 1996; Huang et al., 2004).