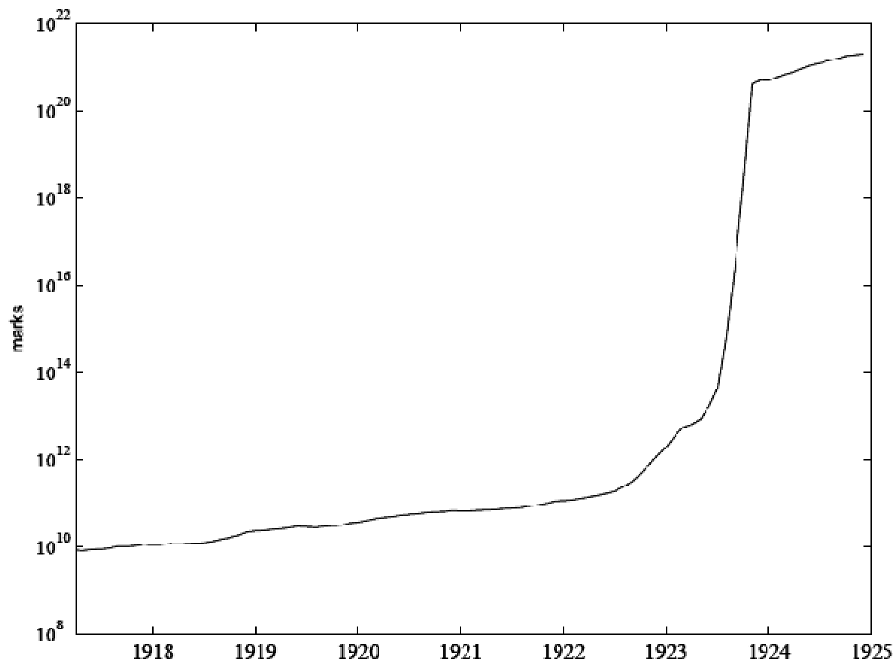
payable in gold marks and dollars (denominated in gold) and tax revenues were payable in paper marks. The inability (unwillingness) to raise taxes sufficiently or to borrow funds to pay the reparations abroad (as was done earlier in 1871 after France's defeat by Germany in the Franco Prussian war) meant that the fiscal deficits would have to be monetized (in the conventional lexicon) or in terms of the fiscal theory – that the price level would have to rises. Rising prices and falling exchange rates (see figures 1 and 2) led to a burgeoning fiscal deficit and an explosion in nominal debt. The resulting hyperinflation reflected both a stalemate between France and Germany over the pace and timing of reparations and political chaos within Germany which impeded a solution to the fiscal impasse.

Figure 1: Reichsbank Notes in Circulation, 1917-25



Soucre: Francois Velde, Early Twentieth Century Hyperinflations [Paper presented at the conference 'Money in The Western Legal Tradition', Cambridge University, Clare College, August 2012].

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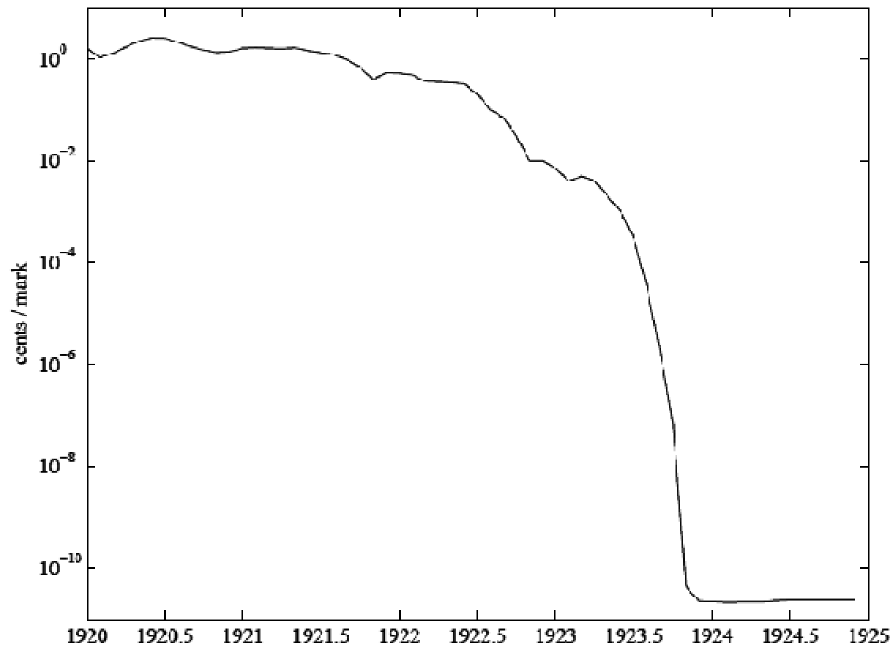
Figure 2: Exchange Rates in New York on Berlin, 1920-25



Source: Velde, Hyperinflations (cf. figure 1).

A comparison between the experience of Germany in the 1920s and the U.S. (or other countries) today may be a bit too extreme. The political environment in Germany after World War I, involving open civil war between the communists and the extreme right and then the occupation of the Ruhr by the French was infinitely worse than today's bickering between the Republican Tea party and the liberal democrats. The disruption in Germany after World War I seems very far removed from the aftermath of the recent recession, which although severe by post World War II standards, when it is compared to the recessions before World War II , is relatively mild. Moreover the fact that reparations were payable in gold, i.e. that external debt was payable in foreign currency, is a major source of crisis instability for emerging countries but not at present for the U.S. which is still the dominant international currency and all U.S. debt is denominated in dollars.

2. France, 1921-26

The experience of France in the 1920s is much more compelling than that of Germany as an example to illustrate the pitfalls of rising debt. This is because the political situation in France was not nearly as dire as in Germany, the French economy was in better shape, French debt was denominated in local currency, and the fiscal crisis that occurred did not

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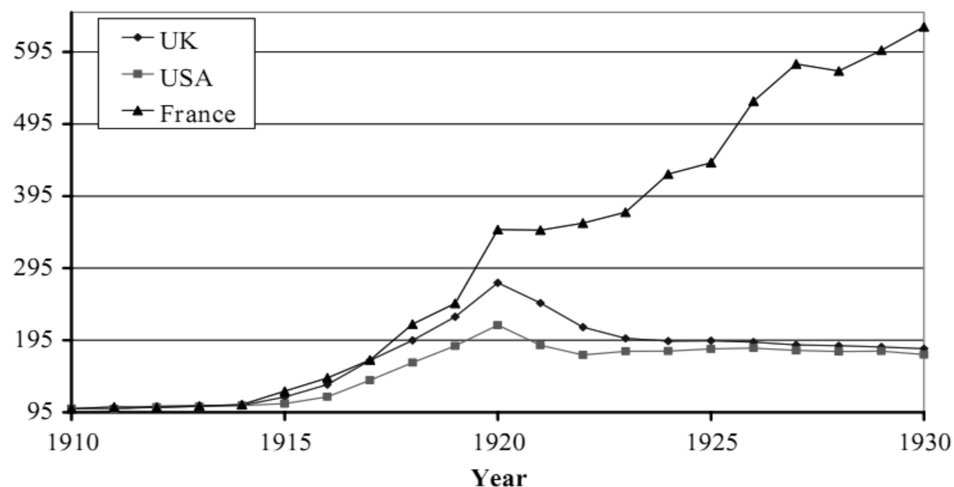
lead to a hyperinflation. The French situation after World War I, in comparison to that of Great Britain has all the elements of active versus passive monetary and fiscal policies.[17] The British experience could be characterized by active monetary and passive fiscal policies whereas the French case was the opposite. Both countries emerged from World War I with more than a doubled price level (see figure 3), a high ratio of debt to GDP (figure 4), large fiscal deficits (figure 5) and a devalued exchange rate (figure 6). France was in worse shape than Britain in all dimensions but not by much. The key difference between the two countries was in their fiscal and monetary stances after the war. France had a higher debt ratio, more short-term debt and a big monetary overhang. France had extensive destruction of its physical capital stock but also a faster growth rate than Britain.

Figure 3: Price Level. 1910-30 (1910=100)



Source: Bordo / Hautcoeur, France (cf. note 17).

17 Michael D. Bordo / Pierre Cyrille Hautcoeur, Why didn't France follow the British Stabilization after World War I?, in: European Review of Economic History 11 (2007), pp. 3-37.

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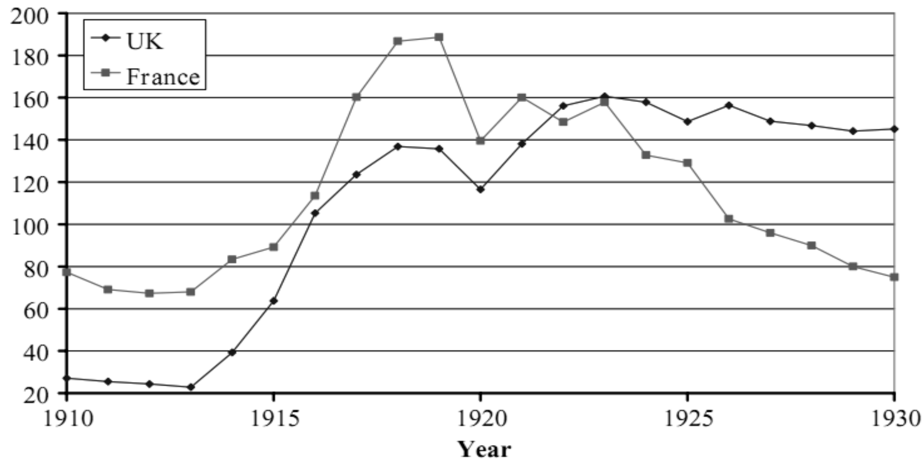
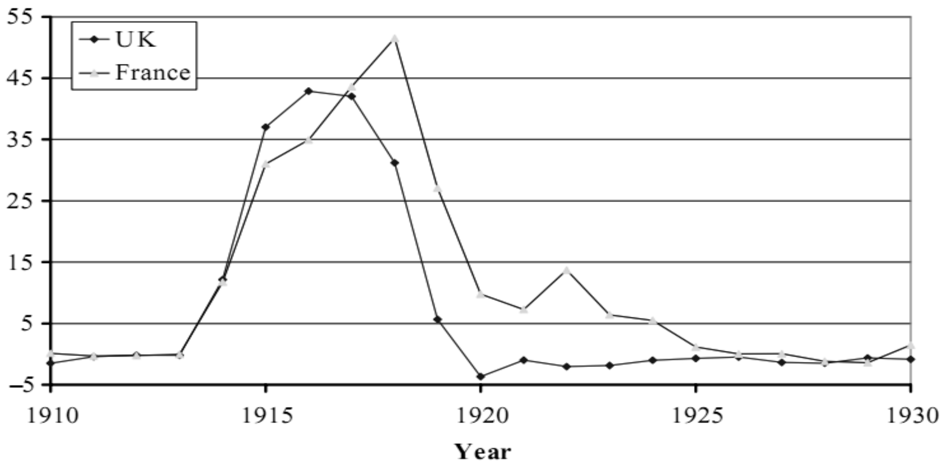
Figure 4: Debt to GDP, 1910-30



Source: Bordo / Hautcoeur, France (cf. note 17).

Figure 5: Budget Deficit (per cent of GDP), 1910-30



Source: Bordo / Hautcoeur, France (cf. note 17).

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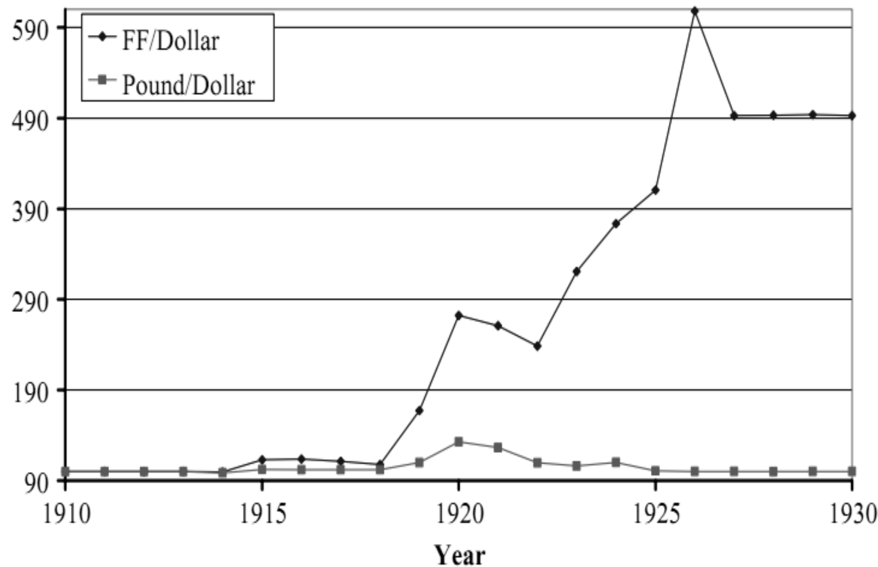
Figure 6: Nominal Exchange Rate, 1910-30



Source: Bordo / Hautcoeur, France (cf. note 17).

The British were able to pull off a successful stabilization and resumption to the gold standard at the original parity beginning in 1919 and culminating in April 1925. The French stabilized later and went back to gold with an 80 per cent depreciation in the franc. More important, France had six years of rapidly rising prices and as in the fiscal theory of the price level model, the rise in the price level reduced the real value of the national debt. Fiscal balance was restored in 1926 by a political compromise between the left and the right involving both rising taxes and reduced government expenditure.

The French fiscal problems are well known.[18] First, like Britain, France financed World War I with a combination of taxes, debt and seigniorage, but France didn't raise taxes as much so that the deficit and debt was higher (see figures 4 and 5). In both countries the central bank absorbed short-term Treasury bills and pegged short-term interest rates.

Second, France, unlike Britain, didn't have the political commitment to stabilization and resumption that the British did. There were three issues; (a) reparations--the belief that German reparations would pay for reconstruction; (b) a struggle between the left and the right over who would cover the fiscal deficit once it became apparent that the Germans would not pay. The left wanted to impose a capital levy and the right wanted to raise excise and other taxes; (c) the French had monetized more of their short-term debt than did the British and consequently had a larger monetary overhang which required more deflation to get back to the pre war gold parity. Moreover the government had to

18 Barry Eichengreen, Golden Fetters. The Gold Standard and the Great Depression, 1919-1939 (NBER Series on Long-term Factors in Economic Development). Oxford / New York 1992.

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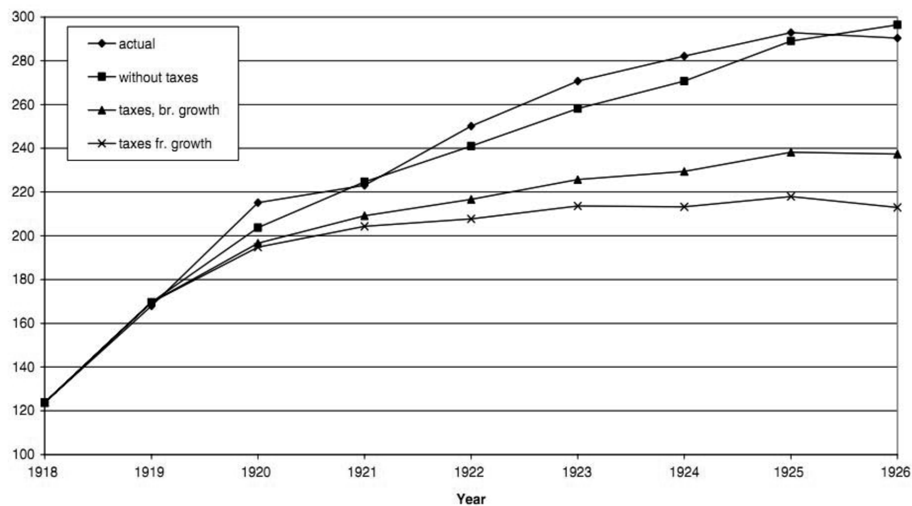
repay its short-term debt to the Banque de France which in turn would raise the deficit and the debt.

The political tug of war continued for seven years with several changes of government and many finance ministers. Instead of raising taxes and cutting expenditures sufficiently to balance the budget, the government kept issuing short-term bills which they had difficulty selling and rolling over and hence they were absorbed by the (passive) Banque de France leading to inflation and a depreciating exchange rate.

An equilibrium which solved the political impasse was finally achieved in July 1926 when a revolt by left wing deputies in Parliament led to an invitation by Raymond Poincare (center right) to take over the government and rule by decree. He raised taxes, cut expenditures and was able to borrow dollars from JP Morgan and Lazards and use the funds to conduct a bear squeeze on speculators selling francs short. This stabilized the franc which was then pegged to gold at a greatly devalued rate in December.

Bordo and Hautcoeur (2007) simulate a model of the French economy in the 1920s and show that it was impossible for France to engineer a British style stabilization and resumption.[19] This is because following the British route of consolidating debt and deflation would have increased French nominal debt to unsustainable levels (see figure 7). This suggests that France had to have a huge increase in the price level and a major devaluation to achieve fiscal equilibrium. We also show that economic circumstances could have allowed stabilization two years earlier, in early 1924 when an earlier Poincare government was in power, with a much smaller devaluation and less inflation than ultimately occurred. It did not happen because Poincare lost the election in the spring and it became impossible to work out such a deal.

Figure 7: Nominal Public Debt, 1918-26



Source: Bordo / Hautcoeur, France (cf. note 17).

19 Bordo / Hautcoeur, France (cf. note 17).

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3. The Great Inflation, 1965-79

The run up in inflation from 1965 to 1979 in the U.S. and other countries was closely connected with fiscal dominance. In the U.S. beginning in the early 1960s in the Kennedy and Johnson administrations Keynesian ideas began to overtake fiscal orthodoxy. Walter Heller, James Tobin and Arthur Okun, leading economists in the Council of Economic Advisors, encouraged the use of activist fiscal and monetary policy to tame the business cycle. They also believed in the Phillips curve tradeoff that expansionary monetary and fiscal policy could reduce the unemployment rate at the expense of higher inflation. In that environment the Federal Reserve began active policy coordination with the fiscal authorities. It also followed a policy of *"even keel"* in which the central bank would suspend monetary tightening while the Treasury was funding government debt. As Meltzer points out once the expansionary Vietnam War and the Great Society programs were underway that the Fed often deferred to the Treasury and held off from monetary tightening.[20]

In the UK the Bank of England was not independent from the Treasury until the 1990s. In the 1960s and 1970s the stance of monetary policy was largely dictated by the state of the government budget. During this period the growth of the sterling M3 money stock was driven largely by the public sector borrowing requirement.[21] As in the U.S., fiscal and monetary policy was dedicated to maintaining full employment. Moreover the Treasury did not believe that the rise in inflation was related to monetary expansion but rather reflected the exogenous union driven rise in money wages.[22] To arrest inflation, the Treasury encouraged the use of incomes policies.

In both countries inflation burgeoned until deliberate policy actions were undertaken in 1979 and 1980 to drastically tighten monetary policy and keep it tight at the expense of a serious recession until the back of inflationary expectations was broken by the early 1980s.

IV. Some Policy Lessons for Today

The German and French cases are cautionary tales about how bad things could get if the high debt ratios that the US and other countries presently have are not resolved. There are also some similarities with the 1970s since the Subprime Mortgage Crisis and Great Recession were resolved by central banks engaging in credit policy and other fiscal actions to preserve the solvency of the financial system. There is a temptation to inflate away the debt as was done in the U.S. after World War II when the debt to GDP ratio was

20 Allan Meltzer, A History of the Federal Reserve, Vol. 2: 1970-1986. Chicago, Ill. 2009.

21 David Laidler, Inflation in Britain. A Monetarist Perspective, in: American Economic Review 66 (1976), pp. 485-500; M. A. Akhtar / D. Sykes Wilford, The Influence of the United Kingdom's Public Sector Deficit on its Money Stock, 1963-1976, in: Bulletin of Economic Research 31 (1979), pp. 1-13.

22 Riccardo DiCiccio / Edward Nelson, The Great Inflation in the U.K. and the U.S. Reconciling Policy Decisions and Data, in: Michael D. Bordo / Athanasios Orphanides (Eds.), The Great Inflation. The Rebirth of Modern Central Banking (A National Bureau of Economic Research Conference Report). Chicago, Ill. 2013 [forthcoming].

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reduced by two thirds from 120 per cent in 1945 within two decades.[23] But unlike the 1950s and 1960s the rate of growth is much lower today, the term structure of the debt is much shorter and the extent of financial repression considerably less.[24] Thus the amount of inflation required to reduce the debt ratio would be much greater than in the postwar period. This would raise the risk of an elevation of inflationary expectations which could then become persistent leading to a repeat of the events of the 1970s Great Inflation.

Moreover even if central banks do not explicitly engage in expansionary policies to reduce the debt overhang, the fiscal theory of the price level predicts that prices will rise to ensure present value balance. Thus there is a strong case for cutting government expenditure and raising taxes to restoring sustainable fiscal balance in the near future.

These historical examples suggest that if the debt ratio gets high enough, then a rise in the price level is pretty likely. However recent history also suggests that a political deal is a good possibility before such an outcome was to be reached. Two pertinent examples tell how such a deal can be worked out without leading to inflation.

Canada in 1995 worked out just such a deal with fundamentals not too much better than presently in the U.S.[25] Pierre Eliot Trudeau's Liberal government ran increasingly higher fiscal deficits and debt ratios from the 1960s to 1980s to finance a massive expansion of the social safety net, with the debt ratio reaching close to 50 per cent by 1984. The succeeding conservative government under Brian Mulroney tried unsuccessfully to restore fiscal balance but rising debt service costs pushed the debt ratio to close to 70 per cent by the early 1990s. After a down grade of its debt ratings by Moodys and two scathing articles in the Wall Street Journal, the succeeding Liberal government, under the guidance of Finance Minister Paul Martin, successfully restored fiscal balance. Martin's 1995 budget drastically cut government expenditures across the board combined with minimal tax increases. Provincial governments followed suit with major spending cuts. Fiscal Stringency was maintained for three years. The result was that the deficit declined from over seven per cent in 1995 to a surplus by the end of the decade and the debt ratio was cut by more than half.

Similar but less dramatic consolidations were put in place in the U.S. first by the George Herbert Bush administration with the Budget Enforcement Act of 1990 and then by the Clinton administration's Omnibus Budget Reconciliation Act of 1993.These two acts reduced fiscal deficits from close to five per cent to a surplus by the end of the 20th century with a combination of cuts in government spending and rise in tax rates. The successful fiscal outcome of the 1990s was most likely aided by the Peace dividend after the collapse of the Soviet Union and by rapid productivity advance.

Although the political climate is considerably more polarized in the U.S. today than it was in the 1990s and the real economy is in much worse shape, a deal may be worked out sooner rather than later to reverse the burgeoning debt following the Great Recession and the future rise in debt expected from the growth of entitlements to an aging population.

23 Joshua Aizenman / Nancy Marion, Using Inflation to Erode the U.S. Public Debt, in: Journal of Macroeconomics 33 (2011), pp. 524-541.

24 Carmen Reinhart / M. Belen Sbrancia, The Liquidation of Government Debt (NBER Working Paper 16893). Cambridge, MA 2011.

25 Fred Barnes, Lessons from Canada, in: National Affairs 8/2011, pp. 77-90; Angela Redish, Canada's Fiscal Turnaround. Mimeo University of British Columbia, December 2011.

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This will likely occur in the short-term to avoid the immediate threat to the economy of the 'fiscal cliff' and in the longer term because of a potential threat to the dollar's *"exorbitant privilege"* and the losses that would entail for the U.S. economy.[26] The exchange rate is a forward looking variable which could easily telescope a future fiscal impasse to the present. A dollar crisis in 1978 triggered President Carter's appointment of Paul Volcker in 1979 to engineer his famous shock which ended the Great Inflation – a similar fiscal event could happen in the U.S. in the not too distant future. In the case of the U.K which is a much smaller and more open economy than the U.S. and where sterling lost its reserve currency status decades ago, the financial markets forced it to consolidate before substantial recovery from the Great Recession occurred. Debate continues over whether it consolidated too soon. Time will tell which strategy is best.

V. Postscript on the Euro Area

The Greek debt crisis is a different story than is the case for the advanced countries after the recent financial crisis and Great Recession. Its story is very close to the 1920s examples discussed above. Absent the ability to inflate away its debt, default is the only option unless it continues to be bailed out by the rest of the Euro area. The other peripheral countries are closer to the Great Depression story but EMU prevents them from using expansionary monetary policy or devaluing and the absence of a fiscal union prevents fiscal transfers from aiding in their adjustment. The EMU authorities are moving closer towards a fiscal union with a central government with some taxing authority and the ability to make inter member fiscal transfers, as well as a banking union. The history of other fiscal/monetary unions suggests that a credible no bail out clause is necessary for them to work without creating a climate of moral hazard, transfer dependence and the monetization by the union of the deficit members' debt.[27]

(Michael D. Bordo, Board of Governors Professor of Economics, Rutgers University, New Jersey Hall, 75 Hamilton Street, New Brunswick, NJ 08901, USA)

26 Barry Eichengreen, Exorbitant Privilege. The Rise and Fall of the Dollar and the Future of the International Monetary System. Oxford 2010.

27 Michael D. Bordo / Lars Jonung / Agnieszka Markiewicz, A Fiscal Union for the Euro. Some Lessons from History (NBER Working Paper 17386). Cambridge, MA 2012.

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