Lessons from the Great Depression

SUMMARY

The Great Depression of the 1930s and the Great Credit Crisis of the 2000s had similar causes but elicited strikingly different policy responses. While it remains too early to assess the effectiveness of current policy, it is possible to analyse monetary and fiscal responses in the 1930s as a natural experiment or counterfactual capable of shedding light on the impact of current policies. We employ vector autoregressions, instrumental variables, and qualitative evidence for 27 countries in the period 1925–39. The results suggest that monetary and fiscal stimulus was effective – that where it did not make a difference it was not tried. They shed light on the debate over fiscal multipliers in episodes of financial crisis. They are consistent with multipliers at the higher end of those estimated in the recent literature, and with the argument that the impact of fiscal stimulus will be greater when banking systems are dysfunctional and monetary policy is constrained by the zero bound.

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From Great Depression to Great Credit Crisis: similarities, differences and lessons

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1. INTRODUCTION

The parallels between the Great Credit Crisis of 2008 and the onset of the Great Depression have been widely commented upon. Paul Krugman posted to his widely read blog a graph comparing the fall in manufacturing production in the United States from its respective mid-1929 and late-2007 peaks (Krugman, 2009). The 'Bad Bears' graph comparing the stock market crashes of 1929–30 and 2008–2009

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has had wide circulation (Short, 2009). Justin Fox (2009) has prominently compared the behaviour of payroll employment in the two downturns.[1]

But these authors, like most other commentators, compared the United States then and now, reflecting the fact that the United States has been extensively studied and the relevant statistics are at hand. This, however, yields a misleading picture. The United States is not the world. The Great Depression and the Great Credit Crisis, even if they both originated in the United States, were and are global phenomena.[2] The Great Depression was transmitted internationally through trade flows, capital flows and commodity prices. That said, different countries were affected differently depending on their circumstances and policies. Some, France for example, were largely passive, while others, such as Japan, made aggressive use of both monetary and fiscal policies. The United States is not representative of their experiences.

The Great Credit Crisis is just as global. Indeed, starting in the spring of 2008 events took an even graver turn outside the United States, with even larger falls in other countries in manufacturing production, exports, and equity prices.[3] Similarly, different countries have responded differently to the crisis, notably with different monetary and fiscal policies.

In this paper we fill out the global picture of the two downturns. We show that the decline in manufacturing globally in the 12 months following the peak, which we place in early 2008, was as severe as in the 12 months following the peak in 1929.[4] We show that global stock markets also fell even faster than 80 years ago. Another respect where the Great Credit Crisis initially 'surpassed' the Great Depression was in destroying trade. World trade fell even faster in the first year of this crisis than in 1929–30, which is alarming given the prominence in the historical literature of trade destruction as a factor compounding the Great Depression. At the same time, the response of monetary and fiscal policies in the recent episode was quicker and stronger.

At the time of writing (December 2009), it would appear that global industrial production and trade have stabilized and are recovering.[5] The question is how much credit to give to policy. This too is something on which comparisons with the 1930s may shed light.

[1] More recently there has been a comparison of the 1930s and now, again focusing on the United States, in IMF (2009a) and Helbling (2009).

[2] While the early literature on the Depression was heavily US based, modern scholarship emphasizes its international aspects (Temin, 1989; Eichengreen, 1992; Bernanke, 2000).

[3] Although this is not so for each and every economy.

[4] Here, then, is an illustration of how the global picture provides a different perspective; the US case considered by Krugman found no such thing. Since our perspective is global rather than American, throughout this paper we look at movements in output following the global (rather than the US) peaks in industrial production. Specifically we place these at June 1929 and April 2008.

[5] Although some forecasters point to the possibility of a double-dip recession.

Section 2 of the paper puts more flesh on these comparative bones. Section 3 then focuses on the policy response to the two crises. The key question is whether the different policy responses in fact are responsible for the different macroeconomic outcomes. To begin to answer this question, we assess the 1930s policy response, asking: what did governments do to combat the Depression? And had they done more, would it have been effective?

Evidence on the (in)effectiveness of policy in the 1930s is relevant to the current debate, we argue, because the causes of the two crises were strikingly similar. Then as now, a substantial real estate boom, centred on the United States and associated with declining lending standards and securitization, caused financial excesses to build up (White, 2009). Then as now, global imbalances added fuel to the fire.[6] Then as now, a sudden reversal of expectations precipitated a sharp decline in equity prices that heightened uncertainty, caused widespread financial distress, and depressed spending (Romer, 1990; Bernanke and James, 1991). This was not an oil-shock- or new-classical-technological-regress-induced recession. Rather, it was an aggregate demand shortfall caused by a negative shock to spending compounded by a coordination problem (that is, by the failure of nominal magnitudes to adjust). We interpret the causes of the recent crisis in the same terms. The similarity in circumstances suggests that evidence on the policy response then carries over to today.

Much is at stake. It has been argued that fiscal policy is unlikely to boost output today because it did not work in the 1930s. Similarly, it is argued that monetary policy is likely to be impotent in the near-zero-interest-rate liquidity-trap-like conditions of 2009 because it did not work in the liquidity-trap-like conditions of the 1930s. But, as we show, fiscal policy where applied worked in the 1930s, whether because spending from other sources was limited by uncertainty and liquidity constraints or because with interest rates close to the zero bound there was little crowding out of private spending. Previous studies have found no effect of fiscal policy, not because it was ineffectual, but because it was hardly tried (that is, the magnitude of the fiscal impulse was small).[7] That said, using more data and more appropriate techniques, we are still able to identify an effect.

Our results for monetary policy are mixed, but again we find some evidence that expansionary policies were effective in stimulating activity.[8] That modern studies (see e.g. IMF, 2009a) have not found equally strong effects in crisis countries, where the existence of dysfunctional banking systems and liquidity-trap-like conditions cast doubt on the potency of monetary policy, appears to reflect the fact that the typical

[6] Although in the 1920s the capital flow was to Germany rather than the United States – see Eichengreen (1992).

[7] To generalize E. Cary Brown's famous conclusion for the United States. To quote, fiscal policy in the United States was unimportant 'not because it did not work, but because it was not tried' (Brown, 1956, pp. 863–6).

[8] See Joseph E. Gagnon's contribution at http://www.econbrowser.com/archives/2009/11/guest_contribut_5.html, where he argues that monetary policy need not be ineffective in liquidity trap conditions.

post-1980s financial crisis did not occur in a deflationary environment like the 1930s or like that in which countries have been suffering over the last year. The role of monetary policy was to vanquish these deflationary expectations, something that was crucially important then as well as now.[9]

2. THE DEPRESSION AND CREDIT CRISIS COMPARED

Figure 1 shows the standard US industrial output indices for the two periods.[10] The solid line tracks industrial output from its US peak in July 1929, while the dotted line tracks output from its US peak in December 2007. While US industrial output fell steeply, it did not fall as rapidly as after June 1929. The logical conclusion is that the crisis facing the economy last spring, while severe, was no Great Depression. 'Half a Great Depression' is how Krugman put it.

We now show that this US-centric view is too optimistic. Figure 2 compares movements in global industrial output during the two crises.[11] Since we are interested in the extent to which world industrial output declined during the two periods, we plot the two indices from their global peaks, which we place in June 1929 and April 2008.[12] As can be seen, in the first year of the crisis, global industrial production fell about as fast as in the first year of the Great Depression.[13] It then appears to bottom out in the spring of 2009 and has since shown strong signs of recovery. This is in contrast with the Depression: while there were two periods of recovery (the second of which, in 1931, was fairly substantial), output fell on average for three successive years.

A distinction between today and 80 years ago concerns the location of industrial production and thus the location of falling industrial output. Eight decades ago,

[9] A point that has been made recently by Eggertsson (2008) for the United States and further generalized here.

[10] These are the same data on US monthly industrial production used by Krugman (2009), drawn from the website of the Federal Reserve Bank of St. Louis. Source: http://research.stlouisfed.org/fred2/series/INDPRO/downloaddata?rid=13.

[11] The recent data are from the IMF, while the interwar data come from two sources. Up to and including September 1932, they are from Rolf Wagenführ's study of world industrial output from 1860 to 1932 undertaken in the Institut für Konjunkturforschung, Berlin. In addition to compiling numerous national indices, Wagenführ (1933) also provides world industrial output indices (Table 7, p. 68). After September 1932, these series are spliced onto an index of world industrial output subsequently produced at the Institut für Konjunkturforschung and published in *Vierteljahrshefte zur Konjunkturforschung* and *Statistik des In-ind Auslands*. The Institut für Konjunkturforschung is coy about how it derived its index, but one can assume that it is a weighted average of country-specific monthly indices for those countries which produced them at the time, and which were largely (but not exclusively) to be found in Europe and North America. Fortunately, European market economies, plus Canada, the United States and Japan, accounted for 80.3% of world industrial output in 1928, while developed countries as a whole (including planned economies such as the USSR) accounted for 92.8%. See Bairoch (1982, p. 304). One can thus be reasonably confident that these indices reflect interwar world trends fairly accurately. If there is a bias in either direction, it is probably to make the interwar contraction seem worse than it actually was, since the peripheral economies for which data were unavailable at the time were in many cases industrializing rapidly, as a result of the breakdown of international trade. This is certainly the judgment of Hilgerdt (League of Nations 1945, p. 127), and the implication is that if anything Figure 2 casts the interwar period in too gloomy a light, and consequently our own in too flattering a light.

[12] We stress that we are *not* attempting to date the world business cycle peaks in either episode. Our only concern is to compare the extent to which output declined during the two episodes, and it makes sense to measure these declines from the months in which output peaked.

[13] The comparison is less favourable to the interwar period if Stalin's rapidly industrializing Soviet Union is excluded. Either way, however, the statement in the text follows.

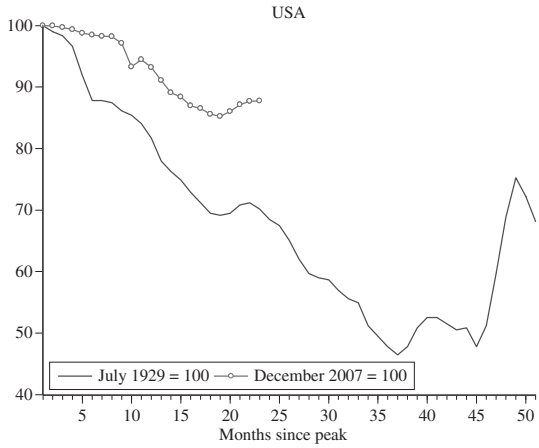

Figure 1. US industrial production, now vs then

Source: http://research.stlouisfed.org/fred2/series/INDPRO/downloaddata?rid=13

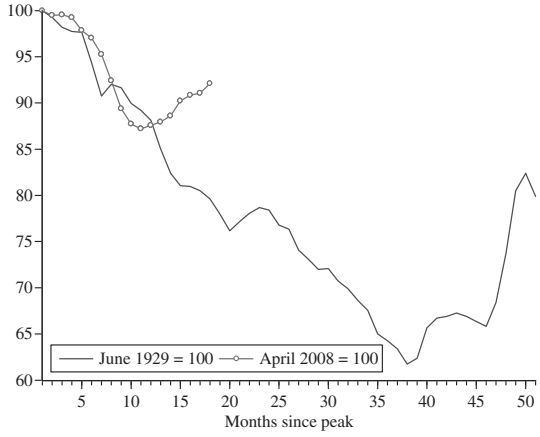

Figure 2. World industrial output, now vs then

Sources: Data graciously provided by the IMF, and Wagenführ (1933), *Vierteljahrshefte zur Konjunkturforschung* (various issues), *Statistik des In-und Auslands* (various issues).

industry was far more concentrated in Europe and North America.[14] It was industrial production that disproportionately collapsed, and it was therefore in Europe and North America where output and employment were disproportionately affected. Back then international trade still largely took the form of the exchange of northern industrial goods for southern primary products, reflecting the international division of labour that emerged following the Industrial Revolution (Findlay and O'Rourke, 2007). Since when the Depression struck it was above all industrial output that collapsed (Figure 3), output in Latin America, Asia and the rest of the developing world, where agriculture and other primary production dominated, was

[14] See note 11.

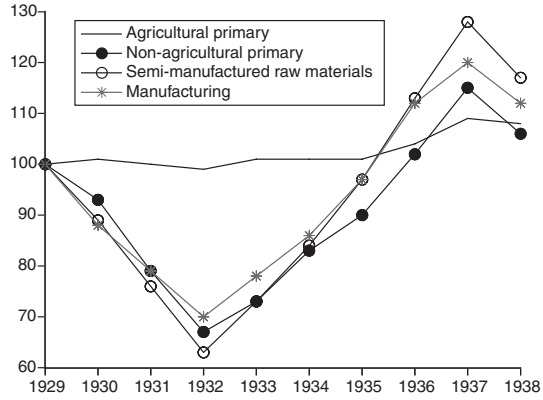

Figure 3. World output, 1929–38 (1929=100)

Source: League of Nations (1939).

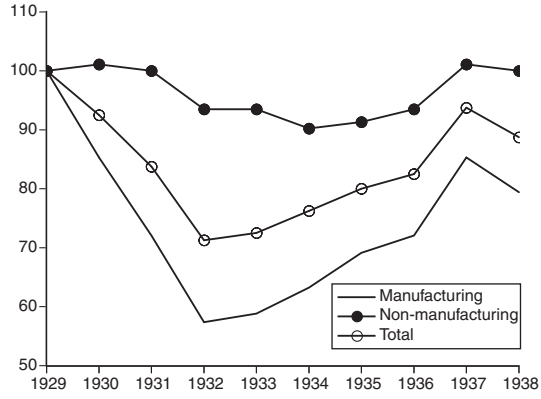

Figure 4. World trade, 1929–38 (1929=100)

Source: United Nations (1962).

more stable. Similarly, international trade in manufactured goods fell far more rapidly than trade in primary products (Figure 4). Given world trade patterns, this translated into a deterioration in Southern terms of trade, as primary commodity prices fell even more rapidly than the prices of manufactures. This was a key mechanism lowering incomes in the south despite its more stable output. (Something similar happened in the oil-producing economies during the 2008–2009 crisis.)

Today, by contrast, industry has spread around the world, and as a result output fell rapidly everywhere in the first year of the crisis.[15]

Overall, then, industrial output fell as fast in the first 12 months starting in April 2008 as it did in the early stages of the Great Depression. It might be argued that

[15] This also has important implications for understanding the collapse of trade, as we shall see.

the initial decline should not be regarded as so alarming because industry accounts for a smaller share of GDP and employment today than it did 80 years ago. While this may be true for early industrializers like Britain, France, Germany and the United States, it is not true for later European industrializers like Finland, Hungary, Ireland, Poland and Portugal.[16] It is even less true for the world as a whole, given the rapid industrialization that has characterized much of the developing world over the last half century.[17]

Another aspect of the comparison is the uniformity (or lack thereof) of the output response. While the mean output response outside the US was quite similar in 1930–1 and 2008–2009 (using the IMF's *World Economic Outlook* forecasts for 2009), the coefficient of variation across countries of growth rates was nearly twice as large in the earlier episode (−1.5% versus −0.8%). While both downturns were globally synchronized, this statistic suggests that synchronization was even greater in 2008–2009.

The League of Nations' Monthly Bulletin provides quarterly data on the volume ('quantum') of world trade.[18] This declined by 36% between the fourth quarter of 1929 and the third quarter of 1932.[19] Figure 5 shows this series, interpolated geometrically to form a monthly series, together with the monthly volume of world trade series produced by the Netherlands Bureau for Economic Policy Analysis.[20] As can be seen, world trade fell much more rapidly in the first year of the recent crisis than at the comparable stage of the Great Depression. It fell by almost 20% in the nine months from April 2008 through January 2009, or by more than half as much as during the three full years 1929–32. It then stabilized, falling only very modestly over the succeeding four months, before increasing moderately in June and vigorously in July and September. World trade was still 14% below its previous peak at the time of writing.

Several explanations have been offered for the greater elasticity of trade with respect to production in the current crisis, including the growth in vertical specialization (Yi, 2009; Freund, 2009; Tanaka, 2009) and the difficulty of obtaining trade

[16] Compare Buyst and Franaszek (2010) and OECD (2009a).

[17] We do not have the monthly or quarterly world GDP data which would allow us to compare the movement of world GDP during the two crises. Nor do we yet have annual data for both 2008 and 2009. On the other hand, the IMF forecast in October that global GDP would shrink by 1.1%. Crucially, this forecast takes account not just of the size of the shock facing the world economy, but of the policy response to the crisis, which as we will see is much more aggressive than the response after 1929. In comparison, between 1929 and 1930, the US economy (which had accounted for a quarter of world GDP in 1929) shrank by 8.9%, and the world economy thus shrank by 2.9%. Excluding the US, the world economy shrank by just 1% between 1929 and 1930. The 'world' here is comprised of the 65 countries for which Maddison (2009) provides data for both years. Note that this sample of countries excludes all of Africa, all of the Middle East bar Turkey, and many other developing countries besides. If they were included, the weight of the US in the world GDP figure would decline, and the size of the 1930 world GDP contraction with it.

[18] That is, the gold value of trade divided by an index of the gold prices of those commodities being traded.

[19] The famous cobweb diagram showing that world trade contracted by 69% between April 1929 and February 1933 plotted movements in the nominal value of world trade, but then as now, the nominal value of trade was largely driven by falling prices (Francois and Woerz, 2009).

[20] Available at http://www.cpb.nl/eng/research/sector2/data/trademonitor.html.

Figure 5. The volume of world trade, now vs then

Sources: League of Nations Monthly Bulletin of Statistics, http://www.cpb.nl/eng/research/sector2/data/trademonitor.html

finance during the credit crunch (Auboin, 2009a, b). Both are problematic. Evidence of first-order effects from disruptions to the provision of trade credit is minimal (recall that the multilaterals and national export-import banks stepped in quickly with emergency credits).[21] And while the growth of vertical specialization can explain a greater absolute decline in trade in the crisis, it cannot on its own explain why there was a greater percentage decline or a greater elasticity of trade with respect to production.[22]

We would point to the changing composition of trade. In 1929, 44% of world merchandise trade involved manufactured goods (United Nations, 1962, Table 1), a proportion that had increased to 70% in 2007.[23] As we saw earlier, manufacturing is more volatile than the rest of the economy, and it was output of and trade in manufactures, rather than primary products, that collapsed in the Depression.

Figure 6 explores the impact of this changing composition. The series labelled '1929 weights' is a weighted average of the series on trade in manufactures and non-manufactures plotted in Figure 4 (the weights being the share of the two groupings in total trade in 1929). Not surprisingly this yields a decline in world trade after 1929 that is close to that actually experienced (6% in 1930 versus the 7.5% actually experienced). The series labelled '2007 weights' replaces 1929

[21] See, however, Amiti and Weinstein (2009), which matches Japanese exporters to the banks which provide them with trade credit and finds a strong link between the financial health of these banks and firm export growth.

[22] The point is a simple one: the extra trade implied by vertical disintegration shows up not just in the numerator (the absolute decline in trade), but in the denominator as well (the total initial volume of trade). On the other hand, vertical disintegration could help to explain the higher elasticity of trade with respect to GDP that we are experiencing today, providing that (a) marginal trade disproportionately involves vertically disintegrated goods; and (b) not all trade is vertically disintegrated. See http://www.irisheconomy.ie/index.php/2009/06/18/collapsing-trade-in-a-barbie-world/ for some simple thought experiments.

[23] International Trade Statistics, 2008, Table II.6, available at http://www.wto.org/english/res_e/statis_e/its2008_e/section2_e/ii06.xls.

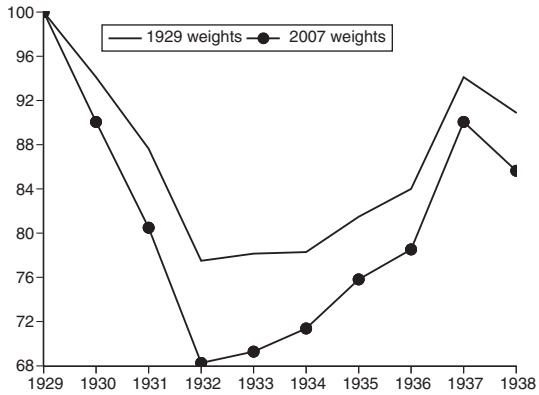

Figure 6. The composition and volume of world trade

Source: See text.

weights (44% for manufactures) with 2007 weights (70% for manufactures). It suggests that if manufacturing and non-manufacturing trade declined at the rate they actually did after 1929, but if manufacturing had been as important a share of world trade as it is today, then total world trade would have fallen much more sharply – by 10% in 1930, comparable to the decline which the WTO is currently predicting for world trade in 2009.[24]

Figure 7 looks finally at global equity markets.[25] At the global level stock markets plunged even faster in the first year of the recent crisis than in the early stages of the Great Depression. To put the impressive rally that began in March 2009 in perspective, it is worth recalling that it has only recently put us back on track with the comparable stage of the Depression and markets remain 24% below peak.

In sum, policy-makers were right to be alarmed in early 2009. When viewed as a global phenomenon, the current economic crisis was a Depression-sized event. Since then conditions have stabilized, or so it would appear. The question is whether policy gets the credit.

3. THE POLICY RESPONSE

It helps to begin with some facts about the policy responses to the two crises. Two things stand out in the comparison of the policy rates in Figure 8. First, the extremely aggressive rate cuts of the Bank of England and the Fed in late 2008, along with less aggressive moves by the ECB. Second, the way in which Germany, Japan, the UK and the US raised interest rates in 1931–2 in a perverse attempt to defend

[24] Note that while this argument can help to explain the severity of today's world trade collapse relative to that of the Great Depression, it will have much less traction in explaining the growth in the elasticity of trade with respect to output over the past two or three decades, which is the focus of Freund (2009).

[25] Using the Global Financial Database world price index.

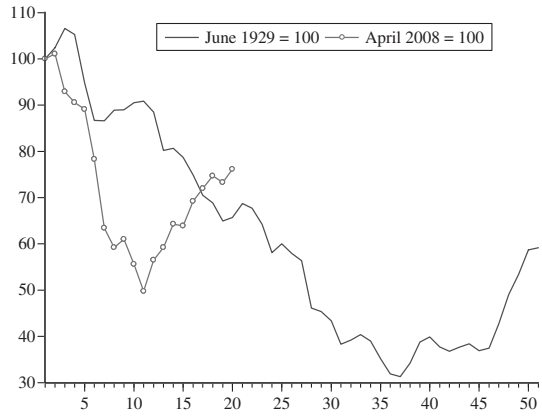

Figure 7. World stock markets, now vs then

Source: Global Financial Database.

their currencies.[26] Figure 9 shows a GDP-weighted average of central bank discount rates for these five countries plus Poland and Sweden.[27] In both crises there was a lag of five or six months before discount rates responded to the downturn, but in the present crisis rates have been cut more rapidly.[28]

Figure 10 shows money supplies for a GDP-weighted average of 17 countries accounting for half of world GDP in 2004.[29] Although it can be argued that permissive monetary policy helped to set the stage for subsequent difficulties on both occasions, monetary expansion was much more rapid in 2004–2008 than in 1925–9. More importantly for present purposes, money supplies continued to grow rapidly in 2008, unlike in 1929 when they levelled off before commencing a rapid decline.

Figure 11 is the analogous picture for the fiscal balance.[30] While governments also ran budget deficits of some magnitude after 1929 (whether or not they wanted

[26] Efforts that collapsed with devaluation in Britain and Japan and the imposition of exchange controls in Germany in the third quarter of that year, and with US abandonment of the gold standard some 18 months later.

[27] Discount rates are taken from Bernanke and Mihov (2000) for the interwar period, and from the relevant central bank websites for today (see Appendix 1). The GDP data used in the weighted averages are taken from Maddison (2009), and refer to 1929 and 2006 (the latest year for which he provides data).

[28] And from a lower initial level.

[29] Argentina, Australia, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, Italy, Japan, Norway, Portugal, Sweden, Switzerland, the UK and the US. The 1925 and 2004 GDP data used to weight individual countries' money supply series are taken from Maddison (2009). For the interwar period, the sources are given in the data appendix: the data are for M1 for all countries bar Denmark, Finland and Sweden, for which we only have M2. The modern data are for M1, and the source is the IMF's *International Financial Statistics* and the OECD's *Monthly Economic Indicators*. The data are expressed in index form, taking 1925=100 and 2004=100.

[30] As a percentage of GDP. Contemporary data are taken from the IMF's *World Economic Outlook Update* of October 2009, and include forecasts for 2009 through 2014 from http://www.imf.org/external/pubs/ft/weo/2009/02/c1/fig1_7.csv. As before, the interwar data are GDP-weighted averages of individual country data, with the data sources listed in the appendix. We have data for 21 countries: the same 17 as before, plus Bulgaria, Hungary, India and the Netherlands. The interwar data include both ordinary and extraordinary budgets and closed accounts wherever possible. However, the League of Nations (1934, Chapter VII) warns that while it has attempted to capture special accounts (such as those of railways, the post office and other government monopolies), supplementary budgets and the like, this is problematic. These problems will be familiar to fiscal policy specialists in the current period, but in the 1930s they were if anything more severe.

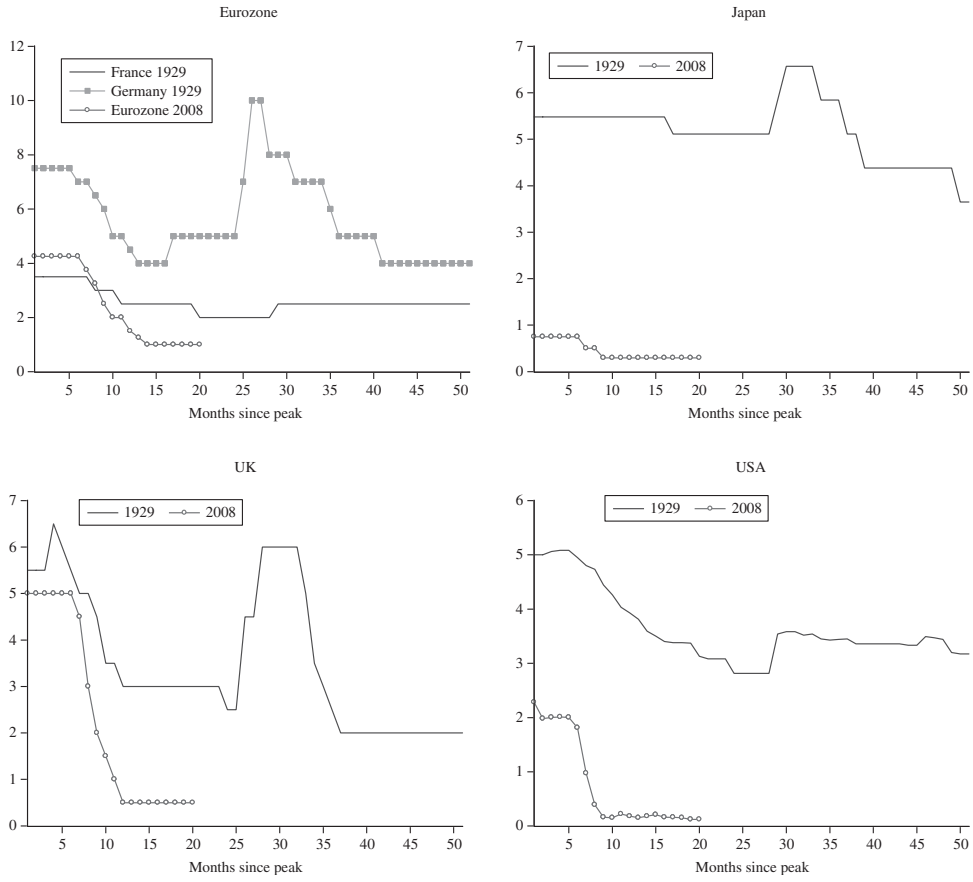

Figure 8. Central bank discount rates, now vs then

Source: Bernanke and Mihov (2000), Bank of England, ECB, Bank of Japan, St. Louis Fed.

to, the collapse of revenues often leaving no choice), the willingness to do so today is greater. Figure 11 also documents that the advanced economies have made the most aggressive use of fiscal policy in the current crisis. But emerging markets, as well, are using fiscal policy more aggressively than the world as a whole in the 1930s.

Recent literature has highlighted the exchange rate regime as shaping the policy response. In the current crisis, the major economies were all on flexible exchange rates, which gave central banks the option of responding aggressively.[31] There are exceptions: a first category consists of countries with currency boards (Hong Kong and Bulgaria, for example). A second concerns those countries with substantial foreign-currency-denominated liabilities for which substantial depreciation would have been destabilizing (Hungary, South Korea). A third concerns countries pegging their currencies to other currencies, notably the euro via the so-called 'ERM II'

[31] Here we are treating the euro area as the relevant economic unit rather than its individual constituent states – say Ireland.

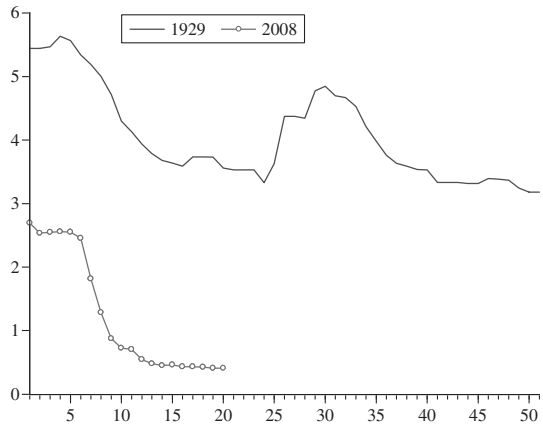

Figure 9. Central bank discount rates, now vs then (7 country average)

Source: Bernanke and Mihov (2000); Bank of England, ECB, Bank of Japan, St Louis Federal Reserve, National Bank of Poland, Sveriges Riksbank.

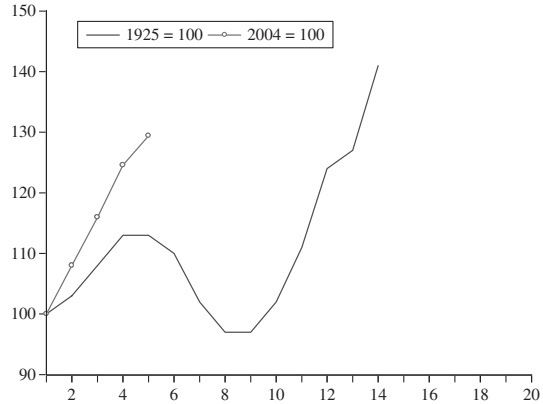

Figure 10. Money supplies, 17 countries, now vs then

Source: IMF *International Financial Statistics*, OECD *Monthly Economic Indicators*, and the data sources listed in Appendix 1.

(Denmark and the Baltic states). In some cases these countries' exchange rate commitments have led to perverse policy responses, or at the least tied their hands in dealing with the current crisis. An example is Denmark, which raised its interest rates twice in October 2008, a time of severe distress in international financial markets.[32] The broader picture, however, is one of a world economy in which monetary authorities were unfettered by exchange rate obligations and consequently free to combat the crisis using both traditional and non-traditional methods.

[32] However, it has since lowered them to 1.15%.

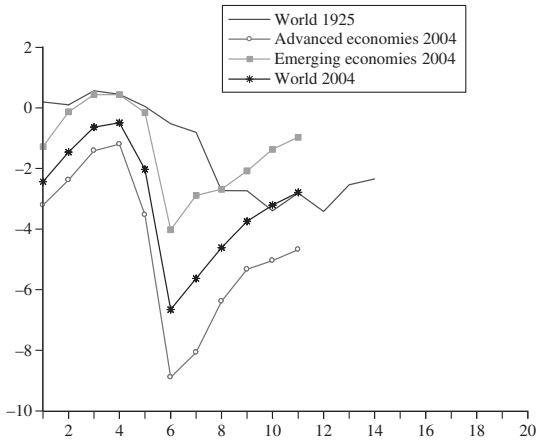

Figure 11. Government budget surpluses, now vs then

Notes: Interwar data are a GDP-weighted average for 21 countries; current data are for the world as a whole.
Source: IMF *World Economic Outlook*, October 2009, and the data sources listed in Appendix 1.

In the 1930s, countries remaining on the gold standard were unable to pursue expansionary monetary policies. They were also reluctant to apply fiscal stimulus since this could lead to a drain of reserves by attracting imports.[33] This suggests distinguishing the gold bloc (Belgium, France and Switzerland); the sterling area (Australia, Canada, Denmark, Finland, Norway, Portugal, Sweden and the UK); other depreciators (Argentina, Brazil, Japan and Spain); the USA, which moved relatively late from being on the gold standard to depreciation in 1933; the exchange control countries (here represented by Germany and Austria); and Italy (which was in name a member of the gold bloc but which from early on imposed foreign exchange controls and bilateral clearing).[34]

Figure 12, based on the same interwar money supply data as Figure 10, plots a GDP-weighted index for each group with the 1929 level set equal to 100.[35] There is a very sharp rise in gold bloc money supplies between 1925 and 1931, driven by an undervalued French currency attracting gold supplies to that country, followed by an equally sharp decline through 1935. Sterling area money supplies declined gently until 1932, when they started to expand, while other depreciators (many of which were commodity exporters and capital importers) saw their money supplies contract between 1928 and 1931 (as commodity prices and capital inflows both fell off) and then recover sharply. The money supply declined sharply in the US between 1929 and 1933 (the point made famous by Friedman and Schwartz), after which it recovered equally sharply. In the exchange control countries, many of which experienced

[33] Although, as we show below, they too saw their budget balances move into deficit due to declining revenues.

[34] We return below to the important question of the potential endogeneity of the decision to abandon the gold standard.

[35] Austria and Spain are not included in the earlier graph since data for these countries are only available through 1936 and 1935 respectively.

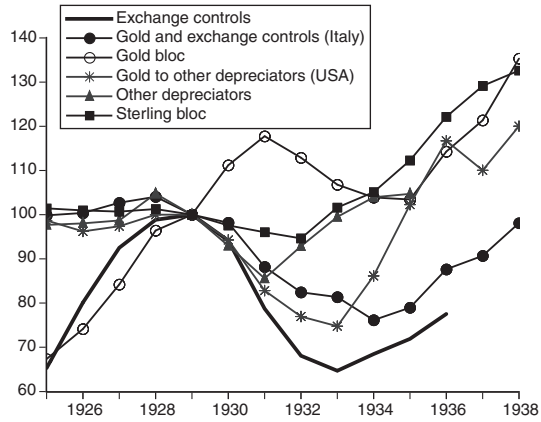

Figure 12. Interwar money supplies, by exchange rate regime

Source: See Appendix 1.

financial crises, money supplies continued falling for several years, after which governments used their room for manoeuvre to reverse the trend.

Figure 13 shows the same breakdown for fiscal policy.[36] All groups were running deficits by 1932, although relatively small deficits by the standards of today. In 1935, the last year for which data are available for the 'other depreciators', the deficits were highest in the gold bloc, the 'gold and exchange controls' bloc, the exchange control countries and the US, in that order. The relatively large deficits of the gold bloc and 'gold and exchange controls' countries, and the sharp reversal in US fiscal policy in 1937 and 1938, stand out. The other depreciators and sterling bloc countries, in contrast, ran fairly balanced budgets.

4. THE IMPACT OF POLICY IN THE 1930s

Eventually, countries started exiting the Depression, with the timing of recovery depending on how long they clung to the gold standard. The US, for example, grew by 8% per annum between 1933 and 1937 (Romer, 1992, p. 757). The question for it and other countries is: to what extent did this represent a 'rubber band' effect, with the strength of the rebound reflecting the scale of the previous collapse, and to what extent did it reflect expansionary monetary and fiscal policies?

Romer's answer is unequivocal: 'Monetary developments were a crucial source of the recovery of the US economy from the Great Depression. Fiscal policy, in contrast, contributed almost nothing to the recovery before 1942' (1992, p. 781). The positive finding for monetary policy reflects abandonment of the gold standard

[36] Using the same measure as in Figure 11. Bulgaria and Hungary are now added to the exchange control group. Czechoslovakia is added to the 'gold and exchange controls' group, along with Italy. Austrian data are only available through 1936, which is why the series ends in that year. Similarly the Spanish data, and hence the 'other depreciators' series, both end in 1935. India is included with the sterling bloc.

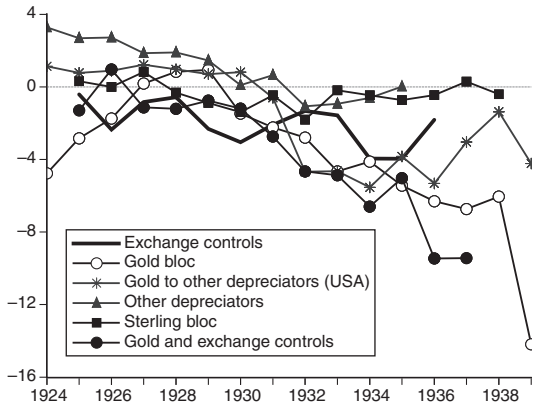

Figure 13. Interwar government budget surpluses, by exchange rate regime

Source: See Appendix 1.

and the large gold inflow after 1933, while the negative finding for fiscal policy reflects the very small size of deficits.[37]

Ritschl (2005) similarly finds that fiscal deficits were too small to have been economically consequential in Nazi Germany.[38] Nor in Sweden, where Keynesian ideas were circulating *avant la lettre*, were fiscal deficits big enough to make a significant difference (Schön, 2007). Appendix 2 shows that what was true for the United States and Germany was true for most other countries: in most cases budget deficits were moderate, and even remained below the 3% threshold that has become familiar to European readers since the 1990s.[39] The decade that saw the publication of the General Theory did not see the widespread adoption of Keynesian pump-priming measures.

But had such measures been adopted, would they have been effective? And did the changes in monetary stance when countries abandoned the gold standard have a significant impact on output? We therefore estimate the impact of fiscal and monetary policy during the interwar period using panel data for 27 countries between 1925 and 1939.[40] We do so in several ways, using various panel VAR techniques as well as instrumental variables.

Before proceeding it is important to ask what kind of results we should expect in this particular context. In the case of monetary policy, it can be argued that the impulse was limited by the zero bound. Given the existence of a near-zero interest

[37] A recent paper by Gordon and Krenn, however, points out that government expenditure in the US started to rise sharply in 1940, and that a large proportion of the recovery thereafter can thus be attributed to fiscal policy.

[38] An alternative view is presented in Abelshauser (1998), Tooze (2006) and Gordon (2008). Of course, if this alternative view is correct, this would only strengthen the basic argument of this paper, which is that fiscal policy would have been effective in the 1930s, had it been used.

[39] See, however, our conclusion regarding the evidence from one prominent counterexample.

[40] Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Chile, Colombia, Czechoslovakia, Denmark, Finland, France, Germany, Greece, Hungary, India, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States.

rate environment in which banks had no incentive to lend out the additional resources they could obtain as a result of the easy credit made available by their central banks, it can also be argued that the response was limited. On the other hand, it has been argued that monetary policy still mattered importantly because it could vanquish expectations of deflation, which were widespread in the period and a significant drag on spending (Temin and Wigmore, 1990). Given this debate, new evidence on the effects of monetary policy is particularly valuable.

In the case of fiscal policy, Christiano *et al.* (2009) argue that fiscal policy should be particularly effective when, owing to the deflationary nature of the environment, nominal interest rates are at the zero bound; intuitively there will be little tendency for fiscal expansion to put upward pressure on rates and crowd out private spending.[41] The IMF (2009a) similarly argues that fiscal spending is likely to be particularly effective in periods of financial crisis, when disruptions to the flow of credit constrain private spending. Again, the 1930s would seem to be the ultimate testing ground of these generalizations.

4.1. Panel VAR estimates

We start by estimating government expenditure multipliers in VAR models, using recursive ordering to identify shocks. Since assumptions regarding ordering are central to the identification strategy, it is important to acknowledge that there is less than complete consensus on the appropriate ordering when the impact of total government spending on output is being considered. The common assumption is that government spending does not respond to output in the current period – in other words, that contemporaneous government spending is exogenous to output. When, however, those responsible for government spending decisions take them with future output movements in mind – since they worry about the depth of the impending recession – this ordering will be problematic. It can be argued that during the Great Depression, before the triumph of Keynesianism and when there was little recognition of how spending decisions might be used to offset changes, both contemporaneous and future, in output and employment, this assumption is defensible. But, regardless of period, the assumption is strong.

We therefore use defence spending as our fiscal policy variable, this being the strategy used by Blanchard and Perotti (2002) to study US fiscal multipliers since the 1950s.[42] Their defence-spending multipliers range from 0.87 to 2.5 in a specification including a deterministic trend, and from 0.82 to 1.91 in the model with a stochastic trend. In a recent paper, Barro and Redlick (2009) also study the impact of defence

[41] In contrast, Cogan *et al.* (2009) find smaller values for the government spending multiplier in their analysis of the 2009 stimulus program because they assume that the bulk of the spending is undertaken when interest rates are no longer at the zero bound.

[42] Below we report some sensitivity analysis substituting total government spending for defence expenditures.

spending on output with a single equation model using annual US data for 1912 through 2006.[43] Their estimated defence-spending multipliers range from 0.59 to 0.77 depending on the sub-period. Hall (2009) uses changes in US defence spending to estimate fiscal multipliers for several sub-periods during 1930–2008. These range from 0.36 to 0.55. Note that these results are based on samples which include not just the Great Depression, but the very different environment of 1945–2006.

Romer (1992) focuses on M1 when assessing the impact of monetary policy in the 1930s. In statistical work not reported in this paper, we also find a strong relationship between M1 and GDP internationally in this period.[44] However, M1 is determined not just by the monetary base, the variable under the control of the central bank, but by the money multiplier, which is endogenous.[45] Hence we have chosen to use the central bank discount rate as our measure of monetary policy.

Given our global perspective, it would be problematic to rely on multipliers derived from the experience of one country.[46] We therefore estimate these using our panel of 27 countries for the period 1925–39. We study the impact of defence spending and monetary shocks by estimating the reduced form of the following structural model:

$$A_0 Z_{i,t} = A(L) Z_{i,t-1} + CX_{i,t} + e_{i,t}$$ [47]

where $Z_{i,t} = \left[G_{i,t}\ Y_{i,t}\ T_{i,t}\ R_{i,t}\right]$ is a vector containing the endogenous variables of the system. G stands for defence spending, Y is GDP, T is government revenues and R is the central bank discount rate.[48] A_0 is a non-singular matrix that captures the contemporaneous relationships between the endogenous variables and is given by:

$$A_0 = \begin{bmatrix} 1 & -\alpha^{YG} & -\alpha^{TG} & -\alpha^{RG} \\ -\alpha^{GY} & 1 & -\alpha^{TY} & -\alpha^{RY} \\ -\alpha^{GT} & -\alpha^{YT} & 1 & -\alpha^{RT} \\ -\alpha^{GR} & -\alpha^{YR} & -\alpha^{TR} & 1 \end{bmatrix}$$

$A(L)$ is the matrix polynomial in the lag operator L that captures the relationships between the endogenous variables and their lags. Following the Akaike Information and Schwarz Bayesian Information Criteria, we include one lag for each endogenous variable. One lag turns out to suffice to eliminate first-order residual auto-

[43] Since their focus is on US military build-ups during wars, they include as explanatory variables changes in defence spending and this variable interacted with a war dummy.

[44] Specifically, in impulse-response functions of estimated VARs analogous to those reported immediately below, but with M1 in place of the central bank discount rate, there is a strong, statistically significant positive effect of an M1 shock on GDP.

[45] So it is not surprising that there is such a strong correlation between M1 and GDP in the data.

[46] As do Romer (1992), Blanchard and Perotti (2002), Barro and Redlick (2009) and Hall (2009).

[47] The reduced-form version is given by $Z_{i,t} = B(L)Z_{i,t-1} + DX_{i,t} + u_{i,t}$, where $B(L) = A_0^{-1}A(L)$, $D = A_0^{-1}C$ and $u_{i,t} = A_0^{-1}e_{i,t}$.

[48] Fiscal variables are deflated using GDP deflators. To ensure cross-country homogeneity we construct index numbers for defence expenditure, revenues and GDP. The model is estimated using the log level of these variables.

correlation. We control for country-specific heterogeneity by including country fixed effects and linear trends. The latter are also included to induce stationarity.[49] We add year dummies to control for cross-country residual autocorrelation. The vector $X_{i,t}$ contains these, and matrix C the associated coefficients. Finally, $e_{i,t}$ includes the mutually uncorrelated structural shocks to each endogenous variable.

We impose the following zero restrictions on A_0:

$$-\alpha^{YG} = -\alpha^{TG} = -\alpha^{RG} = -\alpha^{TY} = -\alpha^{RY} = -\alpha^{RT} = 0$$

These imply that defence spending does not react contemporaneously to shocks to Y, T or R, that Y does not react to shocks to T and R, and that T does not react to shocks to R.

As noted above, the assumption of G not responding contemporaneously to output shocks is consistent with both logic and evidence suggesting that within-year feedbacks from GDP to government spending are not significant.[50] As noted, this assumption is more easily justified when the government-spending variable is defence spending rather than total spending, since defence spending responds to things other than changes in GDP. In the 1930s it was driven above all by Hitler's rearmament programmes and other nations' efforts to match the Nazis in this sphere, and by one-off events like Italy's war in Abyssinia.

We place revenues in third position since that variable responds to the level of economic activity through the operation of the tax system.[51] T is ordered after G on the grounds that government expenditure is planned in a budget that is presented before the start of the fiscal year (Beetsma *et al.*, 2006). In our context it also makes sense to think that the authorities adjust revenues, in part, in response to changes in the need for defence expenditures. Finally, as in Christiano *et al.* (2005), we assume that monetary policy shocks do not affect GDP contemporaneously.[52] That is, we place the central bank discount rate in last position, but as

[49] Stationarity was also checked using two Fisher-type tests (based on the augmented Dickey–Fuller and the Phillips–Perron tests). We find that revenue and the central bank discount rates are stationary. In contrast, we cannot reject the null hypothesis of a unit root in defence spending or GDP. The caveat is that the power of these tests may be undermined by the short time span (15 years at most). However, since we de-mean and de-trend each variable included in the VAR, the system is less likely to be nonstationary.

[50] Beetsma *et al.* (2006) estimate a panel VAR for Finland, France, Germany, Italy, the Netherlands, Sweden and the UK using non-interpolated quarterly data and assuming that government spending does not react to output shocks within a quarter (as in Perotti, 2005). With this model, they later construct estimates of the government spending response to output shocks at annual frequency. Their findings are that it does not react to output shocks within a year. A deeper assessment of the assumption that output does not have contemporaneous impact effects on government spending can be found in Beetsma *et al.* (2009). In that article, the authors show how to evaluate this using the estimates from a quarterly data model. In their application to fiscal policy they conclude that it is reasonable to impose a zero within-year impact of output on government spending (this assumption also implies that government spending has an impact effect on output). Moreover, several other studies, using annual or quarterly data, make this assumption (Blanchard and Perotti, 2002; Perotti, 2005; Monacelli and Perotti, 2006; Galí *et al.*, 2007; Ravn *et al.*, 2007; and Beetsma *et al.*, 2008).

[51] In contrast, Beetsma *et al.* (2006), Blanchard and Perotti (2002) and Perotti (2005) order revenues after government expenditure and before output. However, their measure of revenues is cyclically adjusted net taxes. Our measure is not cyclically adjusted. Thus, it will respond to output shocks within the same year. As a test, we also estimated the model placing revenues before output and find that the output response to government expenditure shocks is not altered.

[52] Admittedly our assumption is stronger since we use annual data.

noted below we check the robustness of our results to changing this assumption. In sum, we use the following Cholesky ordering: *G*, *Y*, *T*, *R*.

Alternatives to what we do here are the 'narrative' and 'sign restriction' approaches. The former, used by Ramey and Shapiro (1998) and Ramey (2009), studies the effect of shocks to a dummy variable that identifies years with large and unexpected changes in fiscal policy. The narrative approach obviously relies heavily on the judgment of the investigator. The two afore-mentioned papers concentrate on the US and take sudden military build-ups as unexpected fiscal shocks. This strategy, also implemented for tax shocks in Romer and Romer (forthcoming), would be difficult to employ in our multi-country panel, since we do not have comparable narrative evidence for all of our countries.[53]

The sign-restriction approach uses the sign of the cross-correlation function in response to shocks to assign a structural interpretation to the orthogonal innovations.[54] This requires taking a strong stand on the predicted sign impact of shocks, which would not be appropriate in the current context. In addition, this approach requires a strong stand on how long these restrictions continue to hold. Papers using this identification strategy typically use monthly or quarterly data and assume that these constraints hold only for a short period, which makes the approach not suitable for our panel of annual data. They also include more endogenous variables than we have available, since they are imposing sign constraints in the context of models incorporating a great deal more economic structure than our own reduced form exercise.

4.1.1. Results

Since real defence spending and real GDP are in log levels, our model yields the elasticity of output with respect to defence spending. To convert this into a defence-spending multiplier we divide it by the ratio of government defence spending to GDP, on the (baseline) assumption that this is the same across countries (the baseline ratio is 2.4%).[55] The defence spending shock is equivalent to 1% of GDP. For shocks to the central bank discount rate, we do not use a scaling factor. The assumed discount rate shock is a one percentage point change.

Figure 14 presents the responses to a shock to defence spending. It shows that innovations in this variable are expansionary. This shock explains, on average, 6% of the forecast error variance of the GDP equation in a five-year horizon. The defence-spending multipliers obtained using this methodology are large: 2.5 on

[53] They use narrative evidence based on congressional reports and other sources to assess significant pieces of tax legislation from 1945 to 2007. They estimate each tax change by the size and timing of its intended effect upon federal tax revenues. This approach avoids the problem of endogeneity because it is based on planned changes in federal tax revenues prior to the legislative process.

[54] See Canova and De Nicoló (2002) and Uhlig (2005) for monetary shocks, or Canova and Pappa (2007) and Mountford and Uhlig (2009) for fiscal shocks.

[55] To construct it, we compute the cross-country average of total defence spending divided by GDP in the 1925–39 period.

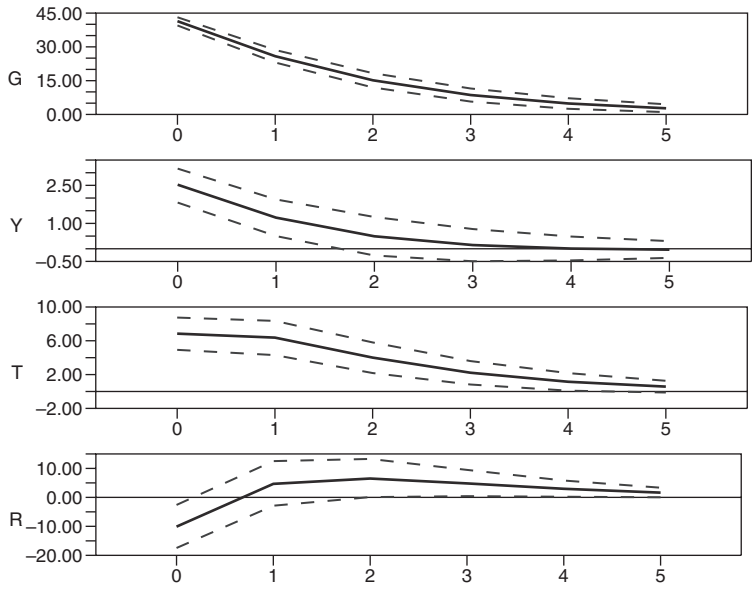

Figure 14. Impulse response functions, shock to defence spending (1% of GDP)

Notes: Solid lines are the point estimates of the impulse-response mean. Dashed lines are the 16th and 84th percentiles from Monte Carlo simulations based on 1,000 replications. The vertical axis indicates defence spending (G), GDP (Y), revenues (T) and the central bank discount rate (R). Each equation in the system includes country fixed effects, country-specific linear trends and year dummies.

impact and 1.2 after the initial year – larger on impact but smaller in subsequent years than those assumed by Romer and Bernstein (2009) for the contemporary United States, and noticeably larger than those obtained in most other recent studies.[56] In robustness analysis below we obtain somewhat smaller multipliers. Still, we would argue that these large multipliers make sense: the fact that nominal interest rates were at the zero bound minimized the crowding out of private spending by public-spending-induced increases in rates.

Figure 15 presents the responses to a one unit shock to the central bank discount rate. The percentage of forecast error variance in the GDP equation attributable to this shock is small. On average this variable explains only 1% of the GDP forecast error variance in a five-year horizon. While a positive shock to the discount rate is associated with a decline in GDP, the effect is not statistically significant.

Our findings are consistent with Gordon and Krenn (2009), which studies the US recovery using a five-variable VAR model estimated on quarterly data from 1920:Q2 to 1941:Q2. In line with our results, they find that innovations in fiscal and monetary policy impacted GDP in the manner predicted by theory. Between 1939:Q1 and 1941:Q4, positive fiscal innovations accounted for 60.8% of the rise in GDP (p. 14).

[56] They are considerably larger than the US defence-spending multipliers reported by Hall (2009).

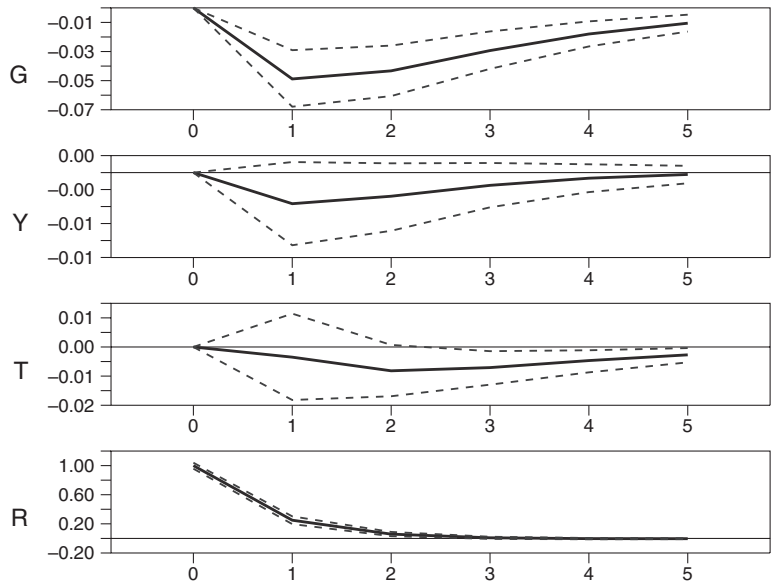

Figure 15. Impulse response functions, shock to discount rate

Notes: Solid lines are the point estimates of the impulse-response mean. Dashed lines are the 16th and 84th percentiles from Monte Carlo simulations based on 1,000 replications. The vertical axis indicates defence spending (G), GDP (Y), revenues (T) and the central bank discount rate (R). Each equation in the system includes country fixed effects, country-specific linear trends and year dummies.

4.1.2. Robustness checks[57]**.** As a first robustness check, we estimated a version of this model using total government spending in place of defence spending. This yields fiscal multipliers of 0.43 on impact and 0.13 after one year, consistent with those estimated for the US in the recent period (which range between 0.37 and 0.9).[58] As noted above, however, there are grounds for doubting whether this specification is adequately identified. We prefer looking at the impact of defence expenditure, which is more exogenous.

A further robustness check tackles the potential for bias in the coefficients owing to the inclusion of country fixed-effects in a short dynamic panel. Country-specific intercepts may induce a correlation between the residuals and the future value of the regressors. As Nickell (1981) and Arellano (2003) note, this bias is most likely to emerge in short panels with a large cross-section dimension. We therefore re-estimated the model excluding the country fixed-effects.[59] The qualitative results are unchanged.[60]

[57] Results not reported here are available on request.

[58] Again, see Blanchard and Perotti (2002), Galí *et al.* (2007), Perotti (2007) and Ramey (2009). To compute the multipliers we scale the responses with the total expenditure over GDP ratio. This is equal to 14%.

[59] Given the length of our dataset, the alternative of implementing GMM methods using many lags of the endogenous variables as instruments would have a high cost in terms of degrees of freedom.

[60] The main difference is that the GDP response to a fiscal shock is more persistent.

Another check is to control for bias due to the omission of other spending measures that may be correlated with defence. To check this, we added an endogenous variable measuring non-defence spending. The GDP response to a defence shock does not change. Nor does it change when we exclude tax revenues from the VAR.

Following other recent studies estimating fiscal multipliers using annual data and panel VARs (e.g. Beetsma *et al.*, 2006, 2008), we also tried including two lags of each endogenous variable. Again the qualitative results did not change. These are also robust to the exclusion of the year dummies. They do not change when we exclude the linear trends or replace these by quadratic trends.

Another check is to alter the Cholesky ordering. Since the assumption of monetary policy not having a within year effect on GDP is strong, we also used an alternative ordering in which we estimated the impulse-response functions placing R in the first position. Figure 16 shows that when the ordering is altered in this way a 100 basis point increase in the central bank discount rate produces a relatively small but now statistically significant fall in output.

We also estimated the models in differences, excluding country fixed effects, linear trends and year dummies. The results do not change for the defence shocks

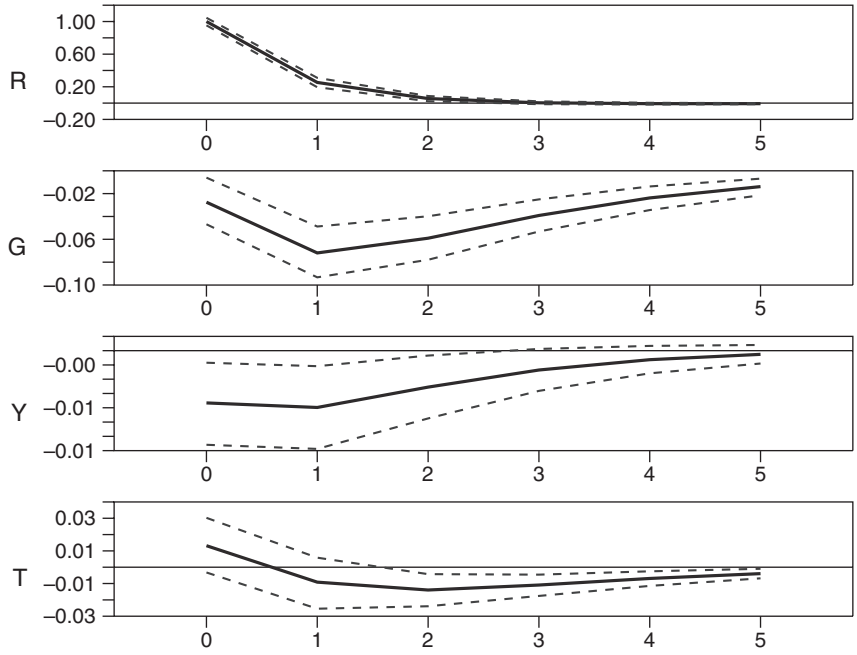

Figure 16. Impulse response functions, shock to discount rate (alternative ordering)

Notes: Solid lines are the point estimates of the impulse-response mean. Dashed lines are the 16th and 84th percentiles from Monte Carlo simulations based on 1,000 replications. The vertical axis indicates defence spending (G), GDP (Y), revenues (T) and the central bank discount rate (R). Each equation in the system includes country fixed effects, country-specific linear trends and year dummies.

(Figure 17). But positive shocks to the central bank discount rate now clearly contract output (Figure 18). This result emerges in both the baseline Cholesky ordering (when R is ordered in the last position) and in the alternative ordering (when R is ordered first).

As a final robustness check, we estimate the reduced form of the following model:

$$A_0 Z_{i,t} = A(L) Z_{i,t-1} + CX_{i,t} + DG_{i,t}^{defence} + e_{i,t},$$

where $Z_{i,t} = \left[G_{i,t}^{total-defence} \; Y_{i,t} \quad T_{i,t} \quad R_{i,t} \right]$. As in a previous robustness check, $G_{i,t}^{total-defence}$ measures non-defence spending. $G_{i,t}^{defence}$ is defence spending and D is a vector with the associated coefficients.

In contrast to previous specifications, we include defence as an exogenous variable in each equation of the system. Therefore, the identification of a defence shock does not rely on a recursive ordering (we do not impose any restriction on A_0).

This is similar to the approach in Ramey and Shapiro (1998), Burnside *et al.* (2004) and Perotti (2007) mentioned above.[61] In these studies, the shocked variable is a dummy variable that identifies abnormal fiscal events like military build-ups.

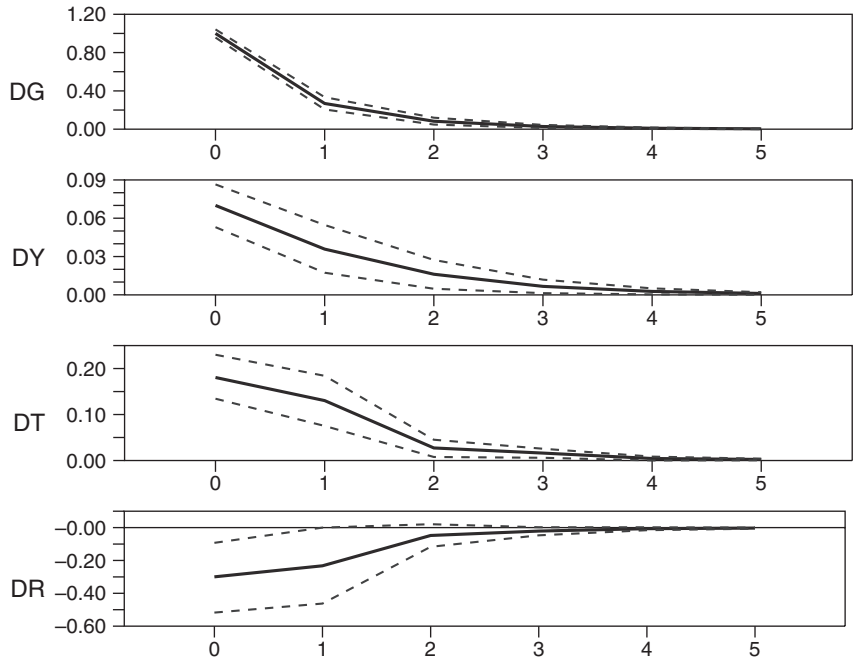

Figure 17. Impulse response functions, shock to change in defence spending. Model in Differences

Notes: Solid lines are the point estimates of the impulse-response mean. Dashed lines are the 16th and 84th percentiles from Monte Carlo simulations based on 1,000 replications. The vertical axis indicates the change in: defence spending (*DG*), GDP (*DY*), revenues (*DT*) and the central bank discount rate (*DR*).

[61] While Ramey and Shapiro (1998) implement this strategy in a univariate model, Burnside *et al.* (2004) and Perotti (2007) do it in a VAR context.

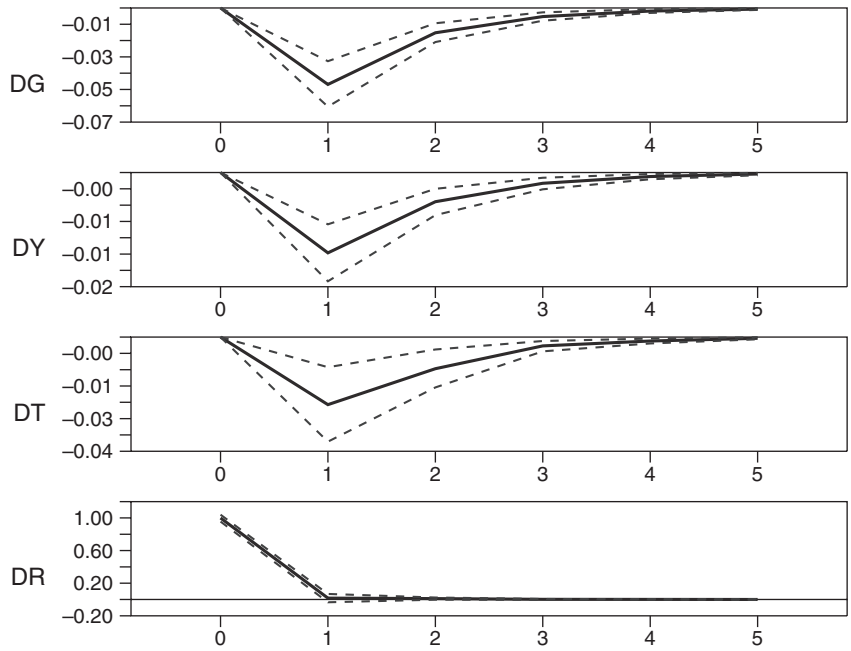

Figure 18. Impulse response functions, shock to change in discount rate. Model in Differences

Notes: Solid lines are the point estimates of the impulse-response mean. Dashed lines are the 16th and 84th percentiles from Monte Carlo simulations based on 1,000 replications. The vertical axis indicates the change in: defence spending (*DG*), GDP (*DY*), revenues (*DT*) and the central bank discount rate (*DR*).

However, we use a continuous variable (defence spending) rather than a binary variable.

Figure 19 shows the responses of all the endogenous variables to a transitory shock to defence spending. As before, we scale the responses to get the associated fiscal multiplier. In line with the previous findings, defence expenditure is expansionary. It produces a statistically significant impact multiplier of 2.1. This positive effect is present in years one, two and three (the associated multipliers are 0.9, 0.4 and 0.2, respectively).

4.2. IV estimates

Another approach is to run panel models using instrumental variables techniques. This approach provides further sensitivity analysis in the sense that it rests on a somewhat different identification strategy (instruments rather than lags). IV methods also allow us to look directly at the magnitude of the output response to changes in overall government spending, the policy variable we are really interested in.[62]

We use data for 1925–39 and the same 27 countries to estimate:

[62] By instrumenting the latter.

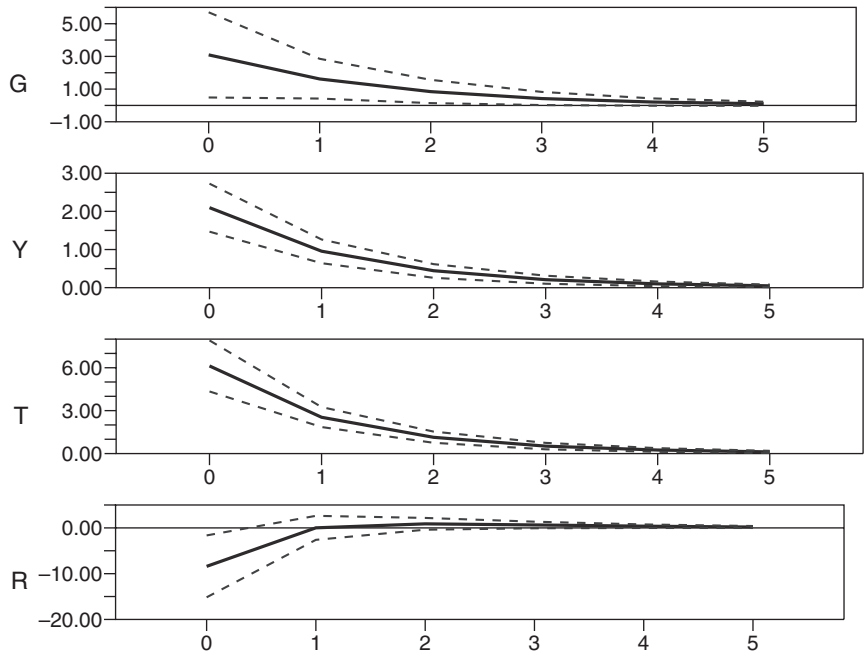

Figure 19. Impulse response functions, shock to defence spending (1% of GDP)

Notes: Defence spending is included as an exogenous variable in each equation of the system. Solid lines are the point estimates of the impulse-response mean. Dashed lines are the 16th and 84th percentiles from Monte Carlo simulations based on 1000 replications. The vertical axis indicates: total government spending minus defence spending (G), GDP (Y), revenues (T) and the central bank discount rate (R).

$$dY_{i,t} = \alpha_i + \lambda_t + \beta_m dR_{i,t} + \beta_f dG_{i,t} + \varepsilon_{i,t}$$

Again $Y_{i,t}$ and $G_{i,t}$ are natural logarithms, so $dY_{i,t}$ is the growth of real GDP, $dG_{i,t}$ is the growth in total real government spending, and $dR_{i,t}$ is simply the change in the central bank discount rate. The α_i are country fixed effects, that is, they allow us to control for unobservable and time-invariant characteristics of the countries in the sample, such as the effectiveness of a country's institutions. Similarly, λ_t are year fixed effects, capturing year-specific shocks that may have affected all countries at once.

Estimating this model by OLS is problematic owing to potential endogeneity: government policies affect GDP, but GDP also affects the macroeconomic policies that governments implement. We therefore instrument for total expenditures and the central bank discount rate.

Our first instrument is defence spending.[63] This variable is strongly related to overall public expenditures and to the government surplus, as shown in the first-stage regressions presented in Table 1. In practice defence spending was determined mostly

[63] Following the literature starting with Blanchard and Perotti (2002).

by political circumstances and security imperatives exogenous to economic activity, as noted in the preceding section. The exogeneity assumption is widely utilized in contemporary analyses; it is, if anything, even more compelling in the run-up to World War II.

As a second instrument we use a dummy variable for whether or not a country was on the gold standard in that year. As we discussed in Section 3, adherence to the gold standard was an important determinant of and constraint on monetary policy. Countries abandoning gold were quicker to cut interest rates in response to the slump. And, as argued in Eichengreen and Sachs (1985) and the subsequent literature, the decision of whether to maintain or abandon gold starting in the late 1920s was heavily influenced by prior inflation experience. Specifically, countries that suffered high inflation in the first half of the decade, when the gold standard was temporarily in abeyance (and before our sample period begins), were more inclined to cling to gold and maintain restrictive monetary policies in the 1930s.[64]

4.2.1. Results. We show the first stage estimates in Table 1. Defence spending is a strong instrument in this sample, the gold standard indicator a weaker one. Table 2 shows the second stage IV estimates (and the corresponding OLS estimates, with and without year dummies, for comparison). As noted above, all equations include country fixed effects and standard errors clustered at the country level.

Table 1. First-stage regressions for economic policies

	Growth in government spending		Change in discount rate	
	(1)	(2)	(3)	(4)
Growth in defence spending	0.2638*** (0.0938)	0.2742*** (0.0826)	−0.0651 (0.2358)	−0.0465 (0.1988)
Change in gold std. adherence	0.0216 (0.0303)	−0.0257 (0.0461)	0.2122 (0.1618)	0.2162 (0.1751)
Year FE	No	Yes	No	Yes
Obs.	327	327	327	327
R-squared	0.0702	0.1303	0.0088	0.2381
F-statistic	5.6782	6.4798	0.8642	7.2203

Notes: Clustered standard errors in parentheses.

Statistical significance: * significant at 10%; ** significant at 5%; *** significant at 1%.

All regressions include country fixed effects, and some (as indicated above) also include year fixed effects.

Sources: See Appendix 1.

[64] Wandschneider (2008), Wolf and Yousef (2007), Wolf (2008) and Eichengreen and Irwin (2009) all provide quantitative support for this hypothesis. Eichengreen (1992) argues that it was through the impact on policies and not through other channels that the effects of the gold standard were felt. Thus, the gold standard indicator also satisfies the exclusion restriction for a valid instrument.

Table 2. Fixed-effects panel regressions of GDP on economic policies-second-stage regressions

	OLS		IV	
	(1)	(2)	(3)	(4)
Growth in govt. spending	0.0576 (0.0402)	0.0536 (0.0359)	0.2568** (0.1108)	0.1925* (0.1100)
Change in the discount rate	−0.0007 (0.0031)	−0.0032 (0.0034)	−0.0228 (0.0546)	−0.0688 (0.0665)
Year FE	No	Yes	No	Yes
Obs.	331	331	327	327
R-squared	0.0383	0.2839	0.0583	0.2889

Notes: Clustered standard errors in parentheses.

Statistical significance: * significant at 10%; ** significant at 5%; *** significant at 1%.

The dependent variable in all four columns is growth in GDP. All regressions include country fixed effects, and some (as indicated above) also include year fixed effects.

Sources: See Appendix 1.

Evidently, the growth of government expenditure has a positive impact on GDP growth. This effect is small and statistically insignificant in the OLS case, but it becomes larger and significant once we correct for endogeneity using instrumental variables. This is consistent with the results produced by the VAR models, where we found much larger fiscal multipliers when we estimated these with (exogenous) defence spending, than with (potentially endogenous) total government expenditure. The IV coefficients imply multipliers between 1.1 and 2.2, and a multiplier of 1.6 when evaluated at the median values of the ratio of GDP to expenditure and of the growth rates of expenditure and GDP.[65]

We find a negative impact of interest rate changes on GDP growth, implying that expansive monetary policy may have had a positive impact on the economy. While the estimated coefficient is much larger in the IV case than in OLS, it is not significant in any of the four cases. We suspect that this reflects the fact that our instruments for the discount rate are especially weak.

4.2.2. Robustness checks. One concern posed by recent commentators is that expansionary fiscal policy may not raise output in countries where debt has reached high levels and deficits raise concerns about fiscal solvency. To get at this, we added the public debt/GDP ratio and interacted it with our fiscal-impulse measure. This also involved re-estimating the first-stage regressions including the debt ratio as an additional right-hand side variable.

Results are in Table 3. The first-stage estimates are unchanged from before, except that the debt ratio also enters significantly (and negatively – countries with more debt are more reluctant to engage in fiscal expansion). Second-stage results

[65] Details of the calculations are available upon request.

Table 3. Fixed-effects panel regressions controlling for debt/GDP ratio

	First-stage regressions				Second-stage regressions		
	Growth in government spending		Change in discount rate			Growth in GDP	
	(1)	(2)	(3)	(4)		(5)	(6)
Growth in def. sp.	0.2478** (0.0960)	0.2676*** (0.0863)	0.0086 (0.2406)	0.0379 (0.2011)	Growth in govt. sp.	0.4124 (0.2423)	0.4226** (0.1925)
Change in gold std.	0.0072 (0.0326)	−0.0284 (0.0495)	0.1944 (0.1663)	0.2193 (0.1835)	Change in disc. rate	−0.0178 (0.0644)	−0.0565 (0.0671)
Debt/GDP ratio	−0.0018** (0.0009)	−0.0006 (0.0009)	−0.0065** (0.0031)	−0.0023 (0.0039)	Debt/GDP ratio	−0.0002 (0.0008)	−0.0003 (0.0006)
					Debt/GDP* growth in govt. spend.	−0.0017 (0.0022)	−0.0037** (0.0017)
Year FE	No	Yes	No	Yes		No	Yes
Obs.	321	321	321	321		321	321
R-squared	0.0402	0.1234	0.0008	0.2306		0.0434	0.2880
F-statistic	3.8956	6.2256	2.3328	44.5519		2.9622	12.2584

Notes: Clustered standard errors in parentheses.

Statistical significance: * significant at 10%; ** significant at 5%; *** significant at 1%.

All regressions include country fixed effects, and some (as indicated above) also include year fixed effects.

Sources: See Appendix 1.

are again basically unchanged. The debt/GDP ratio itself enters negatively, albeit in a statistically insignificant fashion, implying that higher debt slows growth, other things equal. The interaction term is also negative, and is statistically significant when year dummies are included in the specification.[66]

This confirms that fiscal policy is less effective in boosting output in more highly indebted countries. While the fiscal impulse and debt ratio interacted with the fiscal impulse are individually significant only in the last column, they are jointly significant in both cases: at the 5% significance level in the column without year effects, and at the 10% level in the column with them.

We can use the estimated coefficients to back out the level of indebtedness at which deficit spending no longer boosts output.[67] The estimated thresholds are 242% in the column without year effects and 114% in the column with year fixed effects. Our interpretation of these results is that, while higher levels of public debt lessen the effectiveness of fiscal stimuli in general, these still have an expansionary effect under depression conditions up to reasonably high levels of the debt/GDP ratio.

As a final robustness check, we estimated the impact of monetary and fiscal policies by regressing output on government spending shocks and the central bank discount rate. To recover the government spending shocks, we assumed that the public spending variable follows an autoregressive process. We estimated this process and took the residuals associated with it as the fiscal shocks.[68] We then performed a series of panel regressions taking output as the dependent variable and the aforementioned fiscal shocks, the central bank discount rate, and the lagged value of output as explanatory variables, including country fixed effects and (in some specifications) year dummies.

When we compute conventional standard errors, both the aggregate public spending shock and the defence spending shock (which enter positively) are significant at conventional levels; when we cluster the standard errors by country, the defence spending shocks remain statistically significant, but the aggregate spending shocks do not. In contrast, the discount rate enters negatively and is statistically significant at the 99% confidence level, clustered standard errors or not.

Again the bulk of this evidence inclines toward the view that policy could have made a significant difference in the 1930s if governments had actually used it more decisively.

[66] The interaction term between the debt/GDP ratio and growth in government spending uses the predicted values of the latter, obtained in the first-stage regressions.

[67] These thresholds should not be taken too literally given the low level of precision with which the coefficient on the debt-fiscal-impulse coefficient is estimated.

[68] A similar strategy is carried out by Fatás and Mihov (2003) in order to eliminate automatic fiscal responses to the business cycle and get an indicator of discretionary fiscal policy. However, their fiscal policy shocks are obtained by regressing government primary balances on growth, inflation and a short-run interest rate. In our implementation, we continue to instrument the central bank discount rate.

5. CONCLUSIONS

We have asked two questions about the 1930s. First, what policies were actually used to get countries out of the Depression? Second, did they make a difference? In the early stages of the current crisis, which resembled the 1930s for the existence of financial distress, economic slack, and worries about deflation, there was scepticism that monetary and fiscal stimulus would be effective. Monetary policy, it was argued, is ineffective when the banking system is in distress and interest rates approach zero. Fiscal policy is ineffective when the need is to reduce levels of indebtedness, not raise them, and when much previous output and employment in the declining sectors is unsustainable; it cannot simply be replaced by replacing demand. If proof of these propositions was needed, it was said, one only need look to the 1930s.

Our results push back against this scepticism. They suggest that fiscal policy made little difference during the 1930s because it was not deployed on the requisite scale, not because it was ineffective. They suggest a positive impact of government expenditure on GDP during the interwar period, with substantial fiscal multipliers: for example, the first set of VAR exercises suggested that these were 2.5 on impact and 1.2 after one year. Where significant fiscal stimulus was provided, output and employment responded accordingly. Where monetary policy was loosened, recovery occurred sooner. In the VARs in differences, we found that central bank discount policy was effective in boosting GDP.[69] These results are less robust than those for fiscal policy, but again we think that the implications are clear. The most successful economies during the 1930s were those whose governments pursued the least 'orthodox' policies.

Country case studies could be used to further buttress these conclusions. For example, in Japan, the deflationary policies that had been pursued during the 1920s in the attempt to rejoin the gold standard at the pre-war parity were decisively abandoned in December 1931 when the Minseitō government collapsed. The new finance minister, Takahashi Korekiyo, had argued publicly in 1929 that if everyone tried to save more, this depressed demand and output, since 'Even the money spent at geisha houses became income for the geisha and the cooks, and this in turn was respent, increasing demand for the nation as a whole' (Nakamura, 1988, p. 468). The new government therefore abandoned the gold standard, and the Bank of Japan lowered its discount rate from 6.5% in November 1931 to 3.65% in July 1933. The money supply rose, and the yen depreciated sharply, from 0.4985 dollars to the yen in December 1932 to 0.207 dollars to the yen a year later (Allen, 1981, pp. 142–3). Wholesale and retail prices rose, and real wages fell. The government also spent more money, both on the military and on rural village relief, financing these expenditures in large part through domestic borrowing: central government expenditure rose from 1.48 billion yen in 1931 to 2.25 billion yen in 1933.

[69] The effect was also statistically significant in the VARs in levels, when R was first in the Cholesky ordering.

Real gross national expenditure rose by 45% between 1931 and 1936 (Nakamura, 1988, p. 469), by which stage the economy was approaching full employment.

One of the biggest fiscal stimuli in this sample occurred in Mussolini's Italy during 1936–7, as a result of the war in Ethiopia. Italy invaded Ethiopia in October 1935, and the war officially ended in May of the following year, although guerilla warfare continued through 1941. The conquest of Ethiopia involved massive military expenditure accounting for up to half of total government spending. Thereafter the government constructed roads and public buildings and maintained a military presence. Italy thus ran a deficit in excess of 10% of GDP in 1936 and 1937. Various types of compulsion were used to ensure that these bonds were taken up; expenditure was also financed by nationalizing foreign investment, and by the 1936 'day of the wedding ring', when Italians were asked to hand over their gold to the regime (Zamagni, 1993, pp. 253–4). The military build-up implied large orders for industrial output, which rose substantially (Feinstein *et al.*, 1997, pp. 176–7). Trade was reoriented towards the colonies: Italian colonies accounted for less than 3% of Italian exports in the late 1920s, but a quarter of total exports between 1936 and 1939. They were a particularly important market for 'advanced' industries such as chemicals and engineering (Federico, 1998). Italian GDP grew by 6.8% in 1937, by a marginal amount in 1938, and by 7.3% in 1939. According to Toniolo (1980), the Italian economy moved to full employment during this period.

In France, the budget deficit increased substantially beginning in 1935, and GDP grew by 5.8% in 1936. The deficit exploded in 1939, during which year the economy grew by no less than 7.2%. These examples remind us, of course, that the real Keynesian stimulus, when it came, would be associated with military expenditure during World War II, producing very rapid growth in countries like the United States. In our view, peacetime stimulus packages, which could have halted the rise in unemployment that ultimately led to the election of Adolf Hitler (according to King *et al.*, 2008), would have been preferable to the stimulus of war.

The IMF estimated in October that world output would contract by 1.1% in 2009. In November, it estimated that world fiscal balances deteriorated from −0.5% of GDP pre-crisis (in 2007) to −6.7% in 2009, with the equivalent figures for the G-20 being −1% and −7.9% (IMF, 2009b, p. 7). In its October *World Economic Outlook* it estimated that the G-20 would implement crisis-related fiscal stimulus equivalent to 2% of GDP during 2009, a figure which will still be as high as 1.6% in 2010 (IMF, 2009b, p. 13). OECD (2009b) has estimated that OECD governments are embarking on an expenditure stimulus equivalent to 1.7% of GDP during 2008–2010 and on a total fiscal stimulus of 3.4%. Stimulus of this size together with the multipliers we have estimated in this paper suggest that the world economy would have contracted by a great deal more than 1.1% in 2009 if we had seen the same passive policy response that characterized the years after 1929.

A final implication of these conclusions is that it would be foolhardy to withdraw policy support until it is clear that retrenchment can take place without killing off

any incipient economic recovery. Repeating the mistakes of the 1920s is no excuse for repeating those of the 1930s.

Discussion

Silvana Tenreyro

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The contribution

As its title suggests, this paper addresses one of the central issues in macroeconomic policy today: Is the 'Great Credit Crisis' similar to the 'Great Depression'? If so, how? And what policies can stimulate the economy? The paper highlights two broad sets of facts. First, during the 12 months following the corresponding peaks, world macroeconomic conditions were strikingly similar in the two crises. In particular, the falls in global trade, industrial output, and stock markets during the first year of the two downturns were of comparable magnitudes; furthermore, a substantial real estate boom centred on the United States and global imbalances preceded the two crises and, arguably, a sudden reversal of expectations led to uncertainty, widespread financial distress, and depressed spending. Second, the policy responses differed dramatically in the two downturns: in the Great Credit Crisis, the monetary and fiscal policy response in most countries was strong and quick, whereas in the Great Depression the policy reaction was generally weak and delayed. The key question of the paper is whether the (conjecturally)[70] high speed of recovery in the Great Credit Crisis should be attributed to the swifter and stronger policy response. And its answer – and the main lesson drawn from the various pieces of evidence – is decidedly positive.

The main strategy to answer this question is to use qualitative and quantitative evidence from 27 countries during the period 1925 through 1939 to study the economic effect of fiscal and monetary policies. Although, as said, the typical policy response in most countries was weak during this period, there is still enough variation across countries and over time to assess the effectiveness of monetary and fiscal policy in stimulating the economy. And, given the similarities between the early stages of the two downturns pointed out before, the evidence should be relevant for today's crisis.

The qualitative accounts (which are interesting in their own right) suggest that fiscal policy, where and when it was tried, was effective during this period. The quantitative evidence, based on more standard VARs and IV regressions tend

[70] I add – conjecturally – as there is still uncertainty on whether we are already on the recovery path and on the exact timing of the recovery. But throughout my discussion, I will work under the working hypothesis that the recovery was indeed fast.

to confirm this: Fiscal policy was highly expansionary in this period (and, more concretely, estimated multipliers are large). The authors argue that the reason why fiscal policy was not effective to fight the Great Depression is simply that it was not tried hard enough. Monetary policy also appears to be expansionary, but its effects are less precisely estimated. In view of this evidence, the authors argue that the strength and speed of the policy response in the Great Credit Crisis should be credited for the faster recovery.

Comments

This is a carefully executed paper, rich in insights, and of high relevance for the debate over the effectiveness of policies in times of crisis. It is also very well written. The paper's key finding is that during the Great Depression fiscal policy was highly expansionary. In particular, the baseline VAR specification yields a point estimate for the multiplier of 2.5 on impact and 1.2 in the year following the spending increase. Various robustness checks tend to produce multipliers of comparable size.

Large multipliers during this period are consistent with the argument that fiscal policy is particularly effective when nominal interest rates are at the zero bound, as there is less upward pressure on interest rates and less crowding-out of private spending (Christiano *et al.*, 2009). It is also consistent with the Keynesian idea that policies are more expansionary when there is substantial economic slack (there is some evidence of this in Barro and Redlick (2009), who find, for a different period and only the US, that the fiscal multiplier increases with the unemployment rate).[71]

The paper also offers a rich and suggestive narrative account of demand policies in the 1930s in different countries and the macroeconomic changes that followed, lending support to the econometric findings.

In my role as a discussant, I will not attempt to discuss the various pieces of historical evidence presented in the paper, because the authors' knowledge of economic history vastly dominates mine. I will not attempt either to discuss their state-of-the-art econometric strategy, whose every step is carefully justified by the authors. I will instead, figuratively speaking, try to widen the standard-error bands by highlighting three of the underlying assumptions behind this widely used empirical strategy, in an attempt to bring some caution and healthy scepticism to the conclusions[72]:

1) The empirical strategy imposes the same VAR (or IV regression) coefficients for 27 very different countries (e.g. Argentina, Bulgaria, India, Japan, US). One could argue that the parameters characterizing the economy and the conduct of fiscal and monetary policy may differ quite substantially across the various coun-

[71] As mentioned, the paper also investigates the effectiveness of monetary policy, although the results here are less conclusive, as the key statistics are less precisely estimated.

[72] Caution in any encouragement of fiscal spending in times of crisis is almost a necessity when one of the countries in the study is Argentina, perennially in crisis, and the discussant is Argentinean.

tries (or groups). The estimated policy multipliers may thus pick up to some extent these unobservable differences. (Incidentally, if fiscal multipliers differ across countries, a scheme of transferring spending to countries with high multipliers may be advisable.)

2) Similarly, the empirical strategy imposes the same, unchanging VAR (or IV regression) coefficients over a very turbulent period. I tend to think of VARs as fair-weather, first-order approximations of the economy around some steady state (or fundamentals). When big shocks hit, however, it is not clear the linearity survives, as the economies may be moving to a completely new steady state. The Lucas critique applies.
3) As many studies trying to gauge the fiscal multiplier, the paper assumes that the composition of government spending is unimportant, and that one can infer the multiplier from the output effects of (the more exogenous) military spending. The authors do try a broader measure of spending, which yields lower (though still positive) multipliers, but as the authors point out, these figures are not reliable given the endogeneity problems. Using military spending in the analysis is convenient for its exogeneity, but one is left wondering how much could be extrapolated to other components of spending. This is particularly relevant, for example, for the current fiscal stimulus package in the United States, which is widely diversified in the various spending components.

I would like to remark that the data collection effort of the paper is impressive and the authors should be commended for it. It should be noted, however, that measurement error and data comparability were probably not minor issues in this period and for such a vast range of countries. Finally, a perhaps missing piece in the paper (which could perhaps make a different paper) is the consideration of alternative explanations – besides policy – for the 'faster recovery' (e.g., the new economy, with its completely different economic structure; other engines of growth, e.g. China; or simply, yet again, good luck after a bad shock).

To sum up, this is a rich and insightful paper, with interesting and policy-relevant results. A true pleasure to read.

Fabrizio Perri[73]

University of Minnesota, Federal Reserve Bank of Minneapolis, NBER and CEPR

If, as it seems, the 2008 global recession is over and it has not been as severe and as prolonged as the Great Depression, who or what should we thank? Has this happened because we have just been lucky this time or because now we make better and more aggressive use of counter-cyclical policies? Could the Great Depression have been avoided had we used these policies more aggressively at the time?

[73] The views expressed herein are those of the author and not necessarily those of the Federal Reserve Bank of Minneapolis or the Federal Reserve System.

These are the provoking and policy relevant questions raised in this paper. The answers (and key messages) in the paper can be summarized as follows. Fiscal policy was not used during the great depression but that does not mean it was not effective. Indeed VAR analysis suggests the possibility that the government spending multiplier at the time was large, so had the governments at the time used fiscal policy more aggressively the Great Depression could have been milder. Since the current crisis is so similar to the Great Depression it is possible to think that the multiplier is large now as well; hence the use of aggressive fiscal stimulus in this recession is an option that should be taken. In this note I will briefly comment on two points related to these arguments. The first concerns the estimates of the size of the multiplier during the Great Depression. The second qualifies the importance of fiscal policy in the current crisis.

Multiplier uncertainty

The debate on the size of the fiscal multiplier, that is, the impact of an independent increase in discretionary public spending (such as defence spending) on GDP, is an old one but not one that, unfortunately, the profession is close to resolve. Theoretically the range spans from values around 0 (in the case of neoclassical fully Ricardian models) to values well above 2 (in the textbook IS-LM model). Empirical studies (see the recent surveys by Spilimbergo *et al.*, 2009 and Hall, 2009) also find a wide range of possible values depending on the country, the period under consideration, or the empirical methodology followed. This uncertainty reflects the attempt to estimate a linear and time invariant relation in an obviously non-linear and non-stationary world, as in some countries/situations the multiplier is likely to be large while in others it is likely to be small. Also, there is a classic identification problem as both public spending and output are endogenous variables and it is hard to sort out the pure effect of one on the other. The current study represents a welcome addition to the literature as the role of fiscal policy has not been central in recent studies of the Great Depression (see Kehoe and Prescott, 2007) but at the same time it does not really help resolve the overall uncertainty. Indeed the range of estimates reported in this study alone is extremely large as values of the multiplier starting from 0.43 (Section 4.1.2), to 1.1 and 2.2 (Section 4.2.1), to end with 2.5 (Section 4.1.1), are reported. So although I really praise the authors for conducting an extensive sensitivity in estimating the multiplier during their depression, it is exactly their carefulness in the analysis that confirm to the reader that the substantial uncertainty around the size of the multiplier remains a serious issue even during the Great Depression. Certainly the authors make the case that the multiplier *could* have been large during the great recession but they do not make the conclusive case the multiplier was not small. And, *a fortiori*, they cannot make the case that the multiplier during the current recession is not small.

Fiscal policy during the current crisis

One of the many interesting figures in the paper is Figure 11, which shows how fiscal response during the current crisis, measured as budget deficit as a percentage of GDP, has indeed been much larger in the current recession than in the Great Depression. I find it interesting to delve a bit deeper into the reason of the current fiscal response. In Table 4, I do that using US data (from the Congressional Budget Office).

The table breaks down the large (6.6% of GDP) increase in the US budget deficit $\Delta B/Y$ from 2008 to 2009 in four components: change in government revenues $\Delta R/Y$; change in discretionary spending $\Delta G_D/Y$, changes in mandatory spending $\Delta G_M/Y$ and change in interest payments $\Delta I/Y$: The table shows that the large part of the increase in the US deficit is due to 'automatic stabilizers' such as reduction of government tax revenues and increase in mandatory spending. In particular about two-thirds of the increase in $\Delta G_M/Y$ is due to increases in social assistance program such as social security, medicare, medicaid and unemployment insurance, while the remaining one-third is basically due to the financial sector bail-out. Focusing more on the role of income assistance program in Figure 20 I use micro data from the Current Population Survey (CPS) to assess the impact of the 2008 recession on three classes of working age households[74]: households in the bottom 20% of the earnings distribution, the 10% of households around the median earnings and households in top 10%. The left panel of the figure plots the average earnings for these three groups and clearly shows how the bottom earners (the

Table 4. Change in US budget 2008–2009 (Percentage of GDP)

$\Delta B/Y$ =	$\Delta R/Y$	$-\Delta G_D/Y$	$-\Delta G_M/Y$	$-\Delta I/Y$
−6.6	−2.7	+0.8	+3.6	−0.5

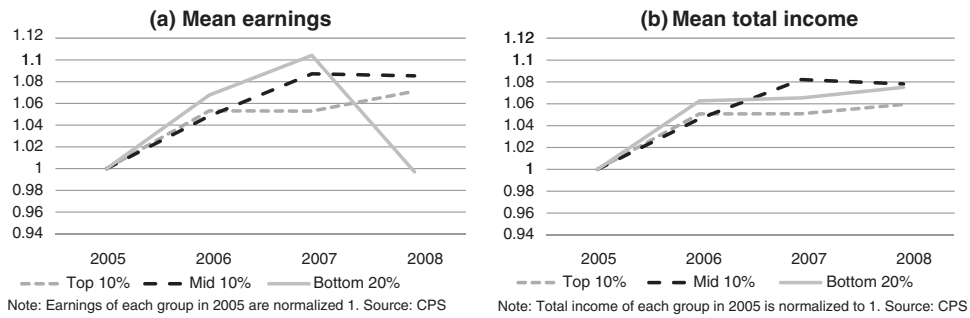

Figure 20. Mean earnings and total income in three groups of households

[74] Working age households are defined as households containing at least one member of age between 25 and 60.

solid line) are the hardest hit by the recession: this is due, quite mechanically, to the fact that unemployment increases in recession and that households with an unemployed member are most likely to end up in the bottom 20% of the earnings distribution. The right panel plots, for the same three groups of households, instead of earnings average total income, which includes government income assistance programs. Notice that although income assistance programs make little difference for the top and median earners (the dashed and dotted lines are very similar across graphs), they make a substantial difference (around 8% of mean income) for the bottom earners in 2008, the year the recession started. In particular it is the presence of income programs such as social security and unemployment insurance that stabilizes the income of households who experienced a severe drop in earnings.

Unfortunately similar data are not readily available for the interwar years but since the Great Depression came in a time of almost non-existent social programmes (no social security, unemployment insurance, welfare) and at a time where the safety nets of rural society were dissolving I strongly suspect that during that time there was very little difference between earnings and total income even for the bottom of the distribution. One lesson that can thus be learned from this analysis of government spending during the recession is that the key difference between fiscal policy now and then is not so much a current stronger discretionary response, but rather the current presence of significant 'automatic stabilizers'. These automatic stabilizers play, in my opinion, two important roles: first by redistributing resources to low earners this implicitly supports aggregate demand in a faster and more efficient way than simple discretionary spending, and that can work as a stabilizer of macroeconomic fluctuations.[75] Second, by easing the pain for the fraction of the population hardest hit by the recession, they reduce economic inequality and poverty and this probably reduces the urge of policy-makers to adopt misguided policies, as we have seen in the years immediately following the Great Depression.

Conclusions

The paper asks what saved us from the Great Depression in 2009 (and in the past 60 years). It is obviously a very important question, and studying history can help us answer it. The conclusion of the paper is that fiscal policy is playing an important role in this. In this note I have provided some arguments that qualify this conclusion a bit; it is probably not so much discretionary fiscal policy (for example, the stimulus programme) that saved the day for the US economy but the presence of a large and long lasting system of 'automatic stabilizers', which was virtually absent during the great depression and put in place right after it. Looking forward the key decisions policy-makers will have to make, especially if unemployment remains

[75] For a theoretical argument on the importance of automatic stabilizers for macro stability see Christiano and Harrison (1999).

high, is for how long to keep these stabilizers in place, that is, for how long to extend unemployment insurance and how long to keep taxes low, as the key trade-off here is between demand stabilization and poverty reduction on one side, versus large budget deficits and poor incentives on the other.

Panel discussion

Katrin Assenmacher-Wesche mentioned that a further similarity between the two crises was that both were triggered by asset price bubbles driven by credit expansion. Roel Beetsma focused on the differences in fiscal policy during the current crisis and the Great Depression. He noted that one major difference is that borrowing constraints are much less now than 80 years ago when there was much less financial intermediation. On this basis he argued that fiscal policy would have been more effective then than it is now. On the other hand, he also pointed out that relatively fewer people paid income tax in the US before World War II and argued that an expansionary fiscal policy may have been much less effective in these circumstances because more people would expect to pay taxes in the future and were therefore likely to hold back on current spending.

Cedric Tille, Leon Bettendorf, George de Ménil and a number of other panellists focused on the role of trade policy and the impact the shift towards protectionism had during the Great Depression. Leon Bettendorf noted that at least during the current crisis similar policies have not been implemented.

Bas Jacobs wondered if the authors considered using their model to test alternative hypotheses. For example, could financial distress help explain the low multipliers in their model? Also in terms of monetary policy, if there was a Keynesian type liquidity trap could they test for this in their model? Leon Bettendorf noted that GDP was only explained by domestic factors in their model and suggested that international spillover effects were also important. For example, the Netherlands has benefited from expansionary policy in Germany.

Silvana Tenreyro believed it was important to discuss and discard alternative explanations for the findings in the paper, for example, the role of China and other emerging economies as engines of growth and the change in the structure of economies towards services.

In response to comments made by Fabrizio Perri, Kevin O'Rourke agreed that the response of fiscal policy and the role of automatic stabilizers in limiting income dispersion is an important issue. This highlighted that there are not just the economic consequences but also political consequences which have to be borne in mind. Kevin O'Rourke agreed with Morten Ravn's comment that it was important to look at the components of the countries' fiscal deficits but noted that country deficits are not included in the regression analysis.

On the discussion on trade policy during both periods, Kevin O'Rourke pointed out that most economic historians believe the change in trade policy was not the most important factor in explaining the output decline during the Great Depression. The decline was mainly a consequence of falling demand and high unemployment. Most of the decline in trade volume at the time can be explained by the decline in output and incomes. However, Kevin O'Rourke believed that trade disruptions had damaging long-run economic effects for many countries.

Appendix 1: Data Sources

Monetary data

Central bank discount rates

Historical data are from Global Financial Data (*Cbdiscount*) for all countries in the sample.

Current data:

- UK: official bank rate
  http://www.bankofengland.co.uk/mfsd/iadb/index.asp?Travel=NIxIRx&levels=2&A36 87XNode3687.x=5&A3687XNode3687.y=6&FullPage=&FullPageHistory=&Nodes=&SectionRequired=I&HideNums=-1&ExtraInfo=true#BM
- Japan: The Basic Discount Rate and Basic Loan Rate
  http://www.stat-search.boj.or.jp/ssi/mtshtml/m_en.html
- ECB Fixed Rate Tenders Fixed Rate
  http://www.ecb.eu/stats/monetary/rates/html/index.en.html
- USA: effective federal funds rate
  http://research.stlouisfed.org/fred2/series/FEDFUNDS/downloaddata?cid=118
- Sweden: repo rate
  http://www.riksbank.com/templates/stat.aspx?id=17184
- Poland: reference rate
  http://www.nbp.pl/Homen.aspx?f=en/statystyka/Instrumenty/instrumenty.html

Gold standard adherence

From Eichengreen (1992, Table 7.1, pp. 187–90).

M1

From the data appendix of Bordo *et al.* (2001): http://michael.bordo.googlepages.com/home3 – in millions, local currency:

- Argentina: D. F. Cavallo and Y. Mundlak (1986). *Estadísticas de la evolución económica de Argentina 1913–1984.* Córdoba: IEERAL.
- Belgium: Statistical Appendix in J. Delbeke (1988). *Geld en Bankkrediet in Belgie, 1877-1983*, Klasse der Letteren, Jaargang 50, Nr. 129, Koninklijke Academie

voor Wetenschappen, Brussels, Letteren en Schone Kunsten van Belgie, Table 1.2, column 7 and Table 1.3, column 9.

- Brazil: IBGE (1990). *Estatisticas Historicas do Brasil: Series Economicas, Demograficas e Sociais de 1550 a 1988*, IBGE, Rio de Janeiro.
- The Netherlands: B.R. Mitchell (1992). *International Historical Statistics: Europe 1750–1988*. Stockton Press, New York.
- Portugal: E. Mata and N. Valério (1994). *Economic History of Portugal*, Presença, Lisbon.
- Spain: Fundación Banco Exterior (1989). *Historical Statistics of Spain*, Siglos XIX–XX.

From national sources:

- Austria: A. Schubert (2006). *The Credit-Anstalt Crisis of 1931*, Cambridge University Press, Cambridge.
- Australia: N.G. Butlin (1984). 'Comparative economic statistics: Australia, New Zealand, Britain, Canada and the United States', Resource Paper in Economic History, Research School for Social Sciences, Australian National University.
- Canada: C. Metcalf, A. Redish and R. Shearer (1998). 'New estimates of the Canadian money stock, 1871–1967', *Canadian Journal of Economics*, 31, 104–25.
- France: C. Saint-Etienne (1984). *The Great Depression, 1929–1938: Lessons for the 1980s*. Stanford: Hoover Institution Press.
- Germany: Kindly provided by Albrecht Ritschl.
- Italy: data from Gaiotti, *mimeo*, Bank of Italy.
- Japan: K. Asakura and C. Nishiyama (1974). *Nihon Keizai no Kaheiteki Bunseki: 1868–1970 [A Monetary Analysis and History of the Japanese Economy, 1868–1970]* Tokyo: Sobunsha Publishing Co.
- Norway: NorgesBank, http://www.norges-bank.no/Upload/Statistikk/HMS/c5.xls
- Switzerland: Swiss National Bank, *2007 Historical Time Series*, Zurich, http://www.snb.ch/en/iabout/stat/statpub/histz/id/statpub_histz_actual
- United Kingdom: B.R. Mitchell (1998). *British Historical Statistics*, p. 674. Cambridge University Press, Cambridge.
- United States: M. Friedman and A.J. Schwartz (1963). *A Monetary History of the United States: 1870–1960*. Princeton University Press, Princeton.

From the League of Nations/Mitchell (in millions, local currency):

Bulgaria, Chile, Colombia, Czechoslovakia, Denmark, Ecuador, El Salvador, Finland, Greece, Hungary, India, Ireland, Korea, Mexico, New Zealand, Paraguay, South Africa, Sweden, Taiwan, Uruguay.

Fiscal data

Government revenues and expenditures

From the League of Nations Yearbook (in millions, local currency) for all countries except Australia, Italy, Germany and Portugal, for which the sources are:

- Australia: M.J. Abbott (1997). 'The real structural imbalance and fiscal stance in Australia during the interwar years', *Australian Economic History Review*, 37, 69–79.
- Italy: G. Fua (1969). *Lo sviluppo economico in Italia*. Franco Angeli: Vol.III. Milano.
- Germany: kindly provided by Albrecht Ritschl.
- Portugal: N. Valério (2001). *Portuguese Historical Statistics*. Lisbon.

Defence expenditures

From League of Nations (1924–40, several issues): *Armaments Yearbook: General and statistical information*. Accessed online at: http://www.library.northwestern.edu/otcgi/digilib/llscgi60.exe

Other variables

Real and nominal GDP

Real GDP (*rgdp_M*; in 1990 international GK$): from Maddison (2009).

Nominal GDP (*ngdp*; in millions, local currency):

- From Global Financial Data and Mitchell (2003): Argentina, Australia, Austria, Brazil, Bulgaria, Canada, Chile, Colombia, Czechoslovakia, Denmark, Finland, France, Germany, Greece, Hungary, India, Italy, Japan, Mexico, the Netherlands, Norway, Spain, Sweden, the UK and the US.
- From Bordo *et al.* (2001): Belgium, Portugal and Switzerland.
- From Rankin (1992): New Zealand.

Note that we use the nominal and real GDP data to deflate all the fiscal variables in the analysis: government expenditures and revenues, and defence spending.

An additional issue arises in the case of New Zealand, in that GDP estimates from different historical sources – Mitchel (2003) and Rankin (1992), in particular – differ sharply. In the analysis reported in the text we use those in Mitchel (2003). We replicated all the results reported there using the alternative GDP series in Rankin; fortunately all the findings carry over.

Banking and currency crises

From B.J. Eichengreen, and M.D. Bordo (2002). 'Crises now and then: What lessons from the last era of financial globalization', NBER Working Paper No. W8716.

Public debt

Kindly provided by Carmen Reinhart and Kenneth Rogoff except for Australia, for which the source is United Nations. Department of Economic Affairs. 1948. Public debt, 1914–1946. Lake Success, and New Zealand, for which the source is Rankin (1992).

Appendix 2

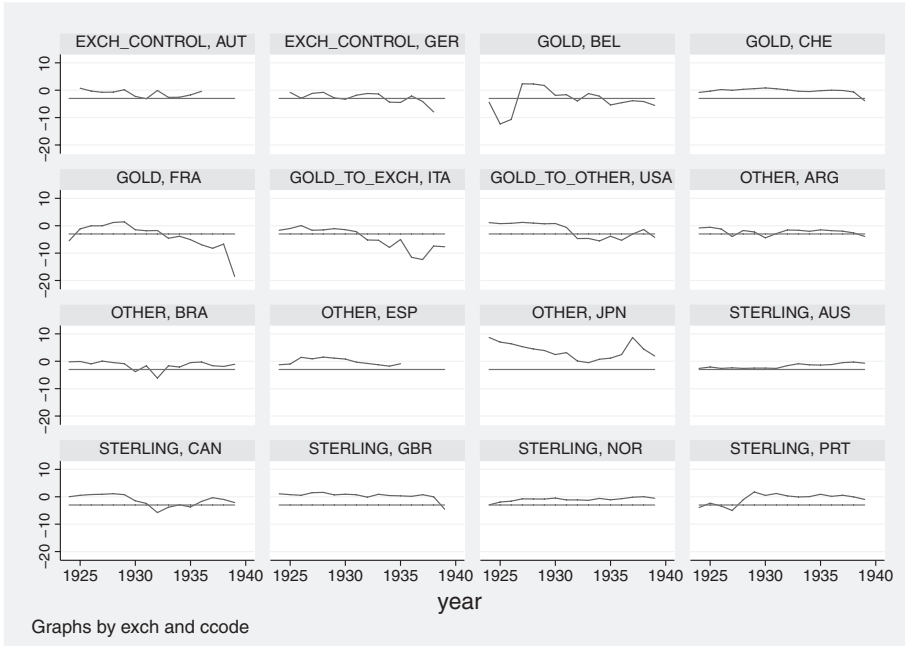

Figure A1. Interwar budget deficits, by country

Note: The straight lines represent budgets deficits of 3% of GDP. *Source*: Appendix 1. Figure 19. Impulse response functions, shock to defence spending (1% of GDP)

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